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REPORT

ON THE



VEGETATION OF THE ANDAMAN ISLANDS.

By Mr. S. KURZ,

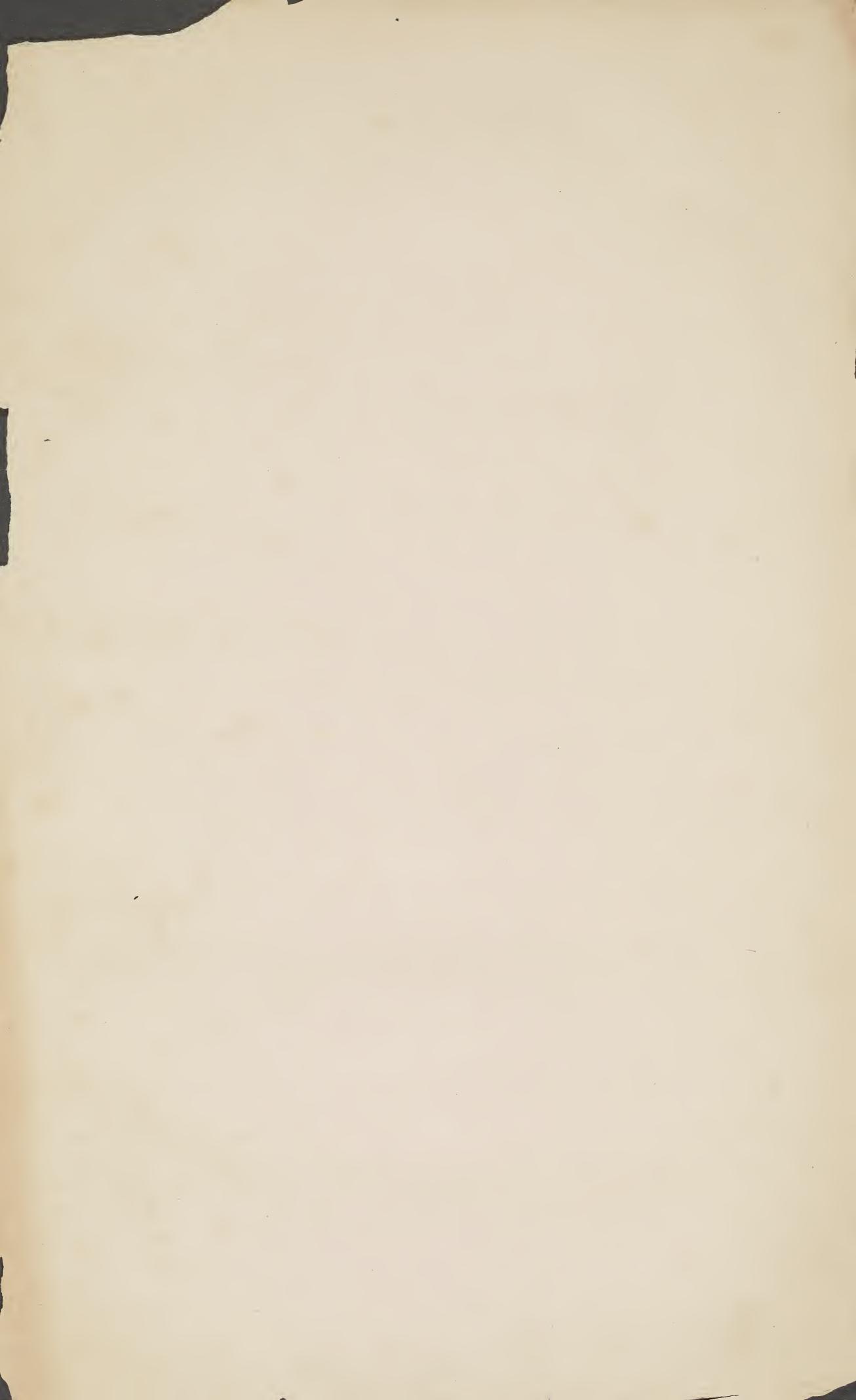
CURATOR OF THE HERBARIUM, ROYAL BOTANICAL GARDENS, CALCUTTA.

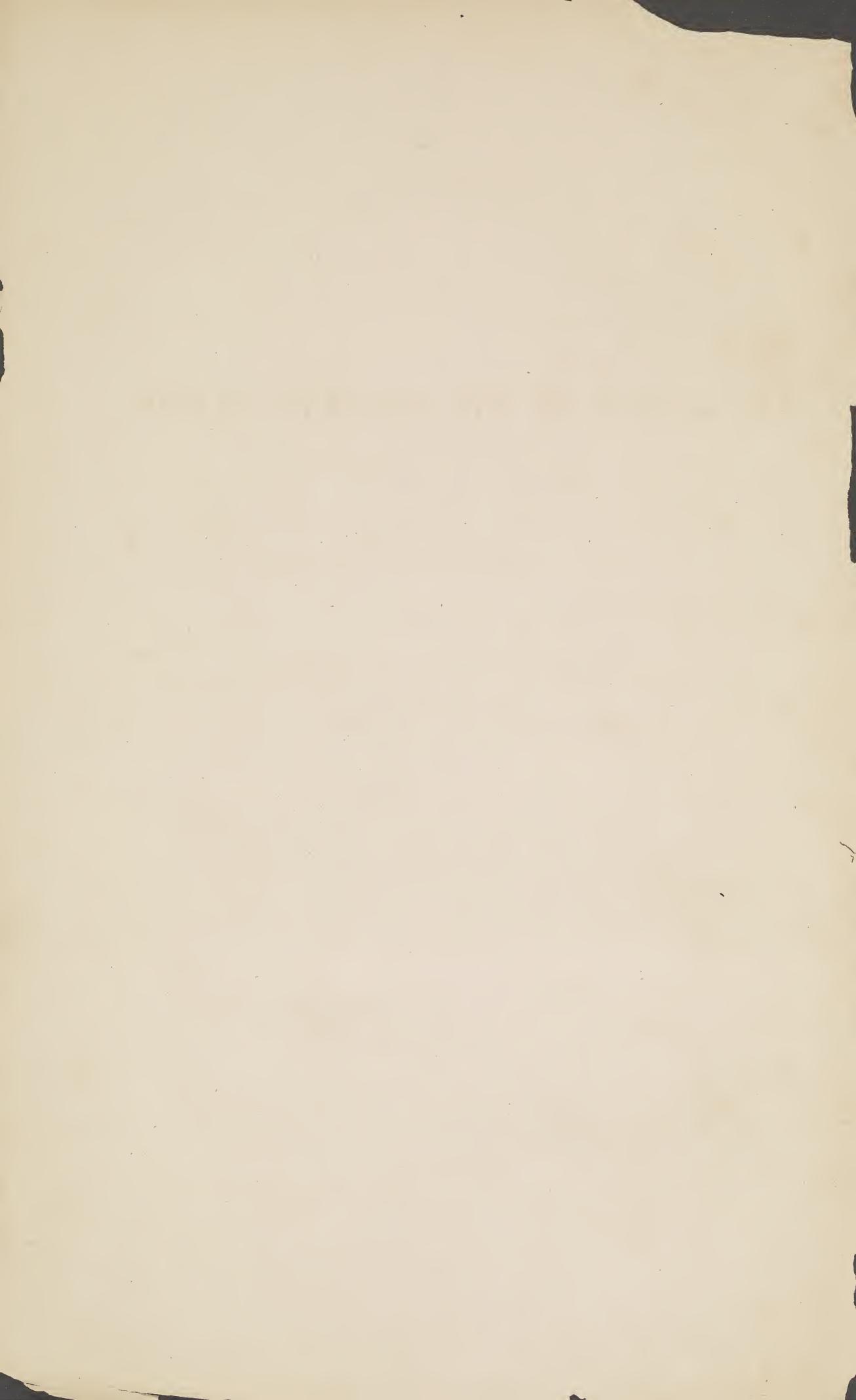
ACCOMPANIED BY A REPORT ON THE FORESTS,
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OFFICE OF SUPERINTENDENT OF GOVERNMENT PRINTING. 1870.







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APPENDIX C .- Sketch map of South Andaman and Adjacent Islands.



REPORT

ON THE

VEGETATION OF THE ANDAMAN ISLANDS,*

BY MR. S. KURZ,

CURATOR OF THE HERBARIUM OF THE ROYAL BOTANICAL GARDENS, CALCUTTA.

Gardens, Calcutta, in accordance with letter No. 1224 of the Government of India, dated 27th February last, to proceed on board Her Majesty's Steamer Prince Arthur to Port Blair, and to collect the material for a Flora of the Andaman Islands; and while doing this to ascertain the proportion which trees known to be valuable for their timber bear to the rest of the forest, and also to identify botanically all timber that might be pointed out to me by the local authorities; I received also instructions to do all in my power to collect living plants and seeds for the Botanical Gardens, Calcutta.

2. Accordingly, I left Calcutta on the 2nd April 1866, and arrived on the 9th of the same month at the place of my subsequent explorations. Having placed myself in communication with the Superintendent of Port Blair, I began my excursions on the 16th April, and explored subsequently nearly the whole of the forest tracts around Port Blair and most of the eastern coast from Macpherson's Straits up to Shoal Bay, as also a good part of the western coast as far as Island Bay before Port Campbell, and visited some of the Labyrinth Islands and Rutland.

On board of Her Majesty's Steamer Diana, which was placed at my disposal for a couple of days, I obtained an opportunity to proceed to the entrance of Middle Straits, whence I explored both the coasts of South and Middle Andaman as far as the western entrance of said Straits.

On the 11th May, however, when on the point of entering the interior of South Andaman from Escape Bay, I was seized by the Burmese convicts, whom the Superintendent of Port Blair had given me to assist me in my work, and was left tied up in the jungles by hand and foot on the ground. These and subsequent circumstances, which rendered the carrying out of my proposed excursions through the Islands impracticable, obliged me to return in Her Majesty's Steamer Feroze to Calcutta, where I arrived on the 20th July last.

The little sketch map (Appendix C.) of South Andaman shows partially the parts visited by me, and also the large extent of country remaining still to be explored.

3. The time of my visit occurred in April and May, the two hottest months in the year. I, therefore, had great difficulty in procuring flowers or fruits, as many of the trees were destitute of them, and many were quite leafless, as were also a number of shrubs; several perennials and annuals, amongst them also some

^{*} This is a reprint of a former report submitted to the Government of India in the early part of the year 1868. Some corrections and additions are now made by permission.

interesting grasses, were burnt up to such a degree that it was impossible to determine anything beyond the family to which they belonged. In the first-half of May, the regular rains set in with great force, and rendered the jungles very unhealthy.

The best time of exploring these Islands is undoubtedly shortly before the close of the rains, viz., from October. In this season, drinking water is still to be had everywhere in the interior parts, and the Flora has not yet suffered from the influence of a dry and hot season.

4. The time allotted to me for the exploration of these Islands was too short to explore the whole of the short to explore the whole of the Island.

Short to explore the whole of the and destitute of any other means of communication than that by water, and consisting of pathless jungles, for the most part never before trodden by any European.

The difficulty I had in obtaining at Port Blair such a conveyance as would enable me to do my work more systematically retarded much the progress of my explorations. I, therefore, was obliged to restrict my excursions to South Andaman and adjacent islands,—the most important part of the group, and extending over rather more than 1,200 square miles.

5. The whole of South Andaman and Rutland is a hilly country, Geological features of South Andataversed by narrow and steep ridges of no great height, and encircled by a complete reef, on which a line of breakers is foaming during the rise of the tide.

These dangerous reefs are formed chiefly of Caryophyllia, Madrepora, Porites, Meandria, and other reef-forming corals. Between high and low water-mark there exists in some places a swampy mass formed by a large number of yellow and flesh-colored carnous sponges, covering the coral reefs, and exhaling a disagreeable smell in the neighbourhood.

The principal ranges all run from south by west to north by east, thus somewhat in the direction of the lines of out-crop of the different strata. They are most developed along the eastern coasts, where they attain sometimes a height of 1,200 to 1,300 feet, sending out numerous spurs towards the sea. Ford Peak on Rutland Island may perhaps exceed 2,000 feet in elevation, and the Saddle Mountain in North Andaman is rather more than 3,000 feet high. Towards the western coasts they gradually become lower; and nowhere on that coast are higher ridges observed than from 200 to 300 feet elevation, bounding usually fertile valleys of comparatively large size. Some isolated hills, however, may be seen further inland, which I estimate to be between 500 and 600 feet high.

The whole surface appears to be intersected everywhere by numerous steep ravines, which open out in all directions, and cause great difficulty in penetrating to the interior parts of the Islands, which, I suppose, lay in general at a very low level.

The hills and ridges slope very precipitously along the sides towards the sea, commonly at an angle of about 45°, and often far more. On their sides, towards the interior, this angle is generally reduced to 20° or 25°, but exceptions can be seen everywhere.

The geological formations of the whole of South Andaman and Labyrinth Archipelago, as well as of the southern parts of Middle Andaman, are, as Mr. W. Blanford, Deputy Superintendent of the Geological Survey, Madras, informed me, quite indentical with those of the Arracan coast.

^{*} For the determination of the rocks and other valuable communications, I am indebted to Dr. Stoliczka, and Mr. W. Blanford, of the Geological Survey of India.

Chloritic Rock.—A broad strip of an indurated chloritic rock, probably some kind of green stone or trap, pervades the interior from Mangrove Bay and Watering Cove northwards in the direction of the higher ranges of the eastern coast and reaches the eastern sea shores at Middle Andaman. The same rocks appear also on Termoklee Island (one of the Labyrinth Islands), where they come in contact with coarsely stratified serpentine rock. This indurated rock appears to be rather felspathic, it is of a greenish color, scarcely stratified, but intersected by veins of quartz and calcareous spar. Small cavities occasionally occur in the rock, exhibiting on the interior of the walls a large number of quartz crystals and other minerals. It is remarkable that, so far as my observations allow me to judge, this green rock seems to occupy the greater part of the level lands, but it does not form ridges or hills of any height worthy to be noted; but we know, in fact, nothing about the formation of the hills in the interior parts.

Sandstone.—The next rock, which covers a great area of South Andaman, is a grey sandstone, dipping to north by east with an angle of from 43° to 45°, or thereabouts. This sandstone is throughout of a very fine grain, showing a large proportion of silica, and occasionally being rather micaceous. The strata exhibit usually a distinct cubic structure. The rock itself decomposes easily, and forms in general a good clay soil.

Along the western coast at Port Mouat this rock is excavated and variously worked out by the sea, exhibiting there many fantastically formed rocks resembling in appearance the limestone rocks on the Mingan Islands.

Often, as for instance very finely on Bird Island near Viper, this sandstone is interlaid with thin layers, colored rusty by oxide of iron.

Serpentine Rocks.—Serpentine rocks are found chiefly to the south of Corbyn's Cove in a south-western direction, and including nearly the whole eastern part of Rutland Island (but also occurring on Termoklee Island). This formation is easily traceable all along the coast by the reddish color of the rocks, or by the brick-colored soil, which originates from its decomposition. The strike and dip are in general the same as that of the grey sandstone.

At Bird-nest Cape, where these rocks attain a height of 70 feet or more, a cubic structure, similar to that of the common grey sandstone, can be observed.

The unaltered rock is mostly of deep green color, as impure serpentine rocks usually are. The stratified portion of the rock, however, which is much more decomposed, exhibits chiefly a reddish brown color, and is very ferrugineous in some places. It would be, perhaps, worth smelting, but I saw no limestone at hand.

Behind Homfray's Ghaut, a narrow strip of serpentine is met with, which might also be usefully employed for practical purposes. It is tolerably pure and quite soft, so as to be easily cut with a knife.

At Macpherson's Straits, a dark-green variety of serpentine rock, with diallage is seen, not only in isolated rocks in the sea, but also on the low ridge of the coast.

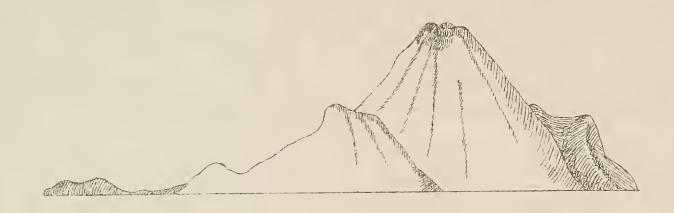
Syenite.—A microcrystalline syenite has been traced near Watering Cove. It seems to be only of a very limited extent, and surrounded everywhere by the indurated chloritic rock.

Conglomerates, formed of coarse pebbles of quartz, chloritic serpentine, and sandstone, have been observed in large quantities at Muddy Creek, at Shoal Bay, and on Termoklee Island. They occur principally in the sea.

No fossils* whatever have as yet been observed on the Andaman Islands.

^{*} I have been informed since by Mr. Prince, Executive Engineer in Birma, that thin seams of coal occur on Viper Island, containing distinct rests of fossil plants.

Barren Island is an active volcano about 50 miles distant from Port Blair, and already too well known to need any further remarks upon it.



Narkondam Island from N. W. $\frac{1}{2}$ W., seen from a distance of about 20 miles.

Narcondam Island has an extinct volcano remarkable for the great height of its cone, being twice as high as the outer wall. Owing to the great height of the cone (perhaps 2,000 feet) in proportion to the surrounding wall, this island must have sunk very much, or the volcano must have been formed from a considerable depth in the sea.

- 6. The diversity of soil, considering the smallness of the islands, is great.

 Generally, however, the different kinds of soils may be brought under the three following heads, which correspond with the three principal formations, viz.:—
 - 1.—The brick-colored soil, extending over the decomposed serpentine rocks.
 - 2.—The yellowish clay, following the sansdstone formation, and therefore the most extensive and important kind of soil.
 - 3.—A greyish or blackish soil, characterised by the considerable quantity of silicious particles it contains, and covering the indurated chloritic or green stone rock. A black humous soil is predominant in the level valleys, especially along the eastern coasts and on Termoklee Island, where the *kuppalee* trees grow beautifully.

According to the greater or smaller amount of moisture, these different kinds of soil are more or less mingled with decayed vegetable matter, and accordingly are more or less fertile.

- 7. No veins of metals have been observed during my excursions on South Andaman and the southern part of Middle Andaman. Oxide of iron is indicated everywhere, as already mentioned, by the rusty color of some sandstones and other rocks; and iron pyrites not unfrequently occur in the chloritic and serpentine rocks.
- 8. When approaching the Middle Straits from the south, a narrow reef can be observed (Barren Reef) at the entrance of Probable sinking state of the Andathe same, extending into the sea from South man Islands.* Andaman in a nearly easterly direction. This reef is covered with dead and bleached trees, variously damaged by the influence of storms and weather. The first impression is accordingly that all these trees have been destroyed by the influence of the north-east monsoon. I observed, however, the same phenomenon along the whole length of the Straits, both on the reefs as well as in the mangrove swamps. Old trunks appeared from time to time in the sea, with their roots still attached to the ground.† This induced me to examine this peculiar feature more carefully, and I landed for this purpose at different places on both coasts of South and Middle Andaman. Some of the stumps of the trees proved to belong to such species as never grow in the mangrove swamps, nor in any locality such as that in which they are now standing. They appeared to me to belong to Pongamia, Erythrina, Thespesia, and even to Mimusops Indica, accompanied by other strongly buttressed trunks. Also stumps of

^{*} In Darwin's Map the Andamans are noted as "rising" on account of the fringing reefs and vulcanism.

[†] I find also the same phenomenon recorded in the Report of the Andaman Committee (Records of the Government of India, XXV., section 157).

Bruguiera gymnorrhiza were frequent, and of a larger size than those which grow close to the shores, but apparently agreeing with those which are everywhere found further up the creeks. All these (except the last mentioned) are trees which never occur in the mangrove swamps, but in a sandy soil just behind them, or else bordering the sea where the shores are very steep and not adapted for the formation of mangrove swamps. This latter circumstance, however, cannot be the case here, the shores at the places where I made the observations being level for some thousand paces inland.

A more evident fact proving the sinking state of these islands* can nowhere be seen more clearly than in these straits. One can there trace in several places the stumps of the sunken trees in the sea up to the state where the trees are just dying by the influence of the sea water, and the subsequent change of the soil by the formation of the mangrove swamp.

The sinking state of the islands is further shown by another fact recorded in the report of the Andaman Committee, dated 1st January 1858, in sections 8 and 9. There it is stated that the sea had encroached some 40 or 50 feet since the first settlement at Chatham Island in Port Cornwallis, so that the store-house that stood there has been destroyed by the sea since the abandonment of the place in 1796. An examination of the spot and of the documents relating to that settlement might give us some guide to determine the rapidity with which these islands are becoming submerged.

Lieutenant Jameson, of Chatham Island, has informed me that a similar encroachment of the sea is taking place at that island in Port Blair.

There are nowhere, as far as I have been able to explore the rocky shores, signs of a recent upheaval. The mighty waves hollow out the soft sandstone and serpentine ridges, until undermined they fall into the sea, and form by their débris a natural barrier against the actions of the waves. An example of this process is afforded by the Bird-nest Cape. The caves of Hirundo esculenta at the same Cape exhibit semi-circular openings, and are nearly at an equal level with the sea. Had any recent upheaval taken place, they would most probably be of an oblong or elliptical shape, or more likely raised far above the sea-level.

Long and broad flat fields of sandstone—layers, almost at a level with the sea and perfectly free from corals, stretch out in several places (especially along the western coasts, but also on Ross Island itself). These are submerged during tide and separate the coral reefs from the rocky coast, which, in other places, is immediately fringed by those reefs.

An examination and careful determination of the corals and nullipores forming those reefs would surely throw much light upon the whole matter. The depth at which certain corals live is known, and the question of upheaval or submersion might be elucidated more easily and more conclusively by a zoologist than by a botanist. That a few coral banks (with living corals on them) are uncovered by sea during ebb I have stated already above, but nowhere along the whole length of the coasts visited by me are coral reefs raised above the tidal level.

I have since visited the Arracan coasts (Akyab and the lower hills of Kolodyne District) which all show a decided rising, and are of very similar formation (sandstone) as those on the Andamans. The phenomena, however, presented to me were quite different from those I have observed on the Andamans, not only as regards the configuration of the coasts, but also its flora.

Andaman Straits, which is impassable at low water for boats, will perhaps afford another good proof of this subsidence. I had no opportunity of visiting these straits.

^{*} They may be also stationary, but, from the evidence adduced, it is more natural to arrive at the conclusions I did

Macpherson's Straits, owing to its more abrupt coasts, does not exhibit this phenomenon, as far as I was enabled to ascertain.

It is also a matter of great interest to decide the question whether the rapidity of the submersion takes place equally through the whole group of islands, or rather whether it is a decreasing one towards the northern extremities.

Dr. Mouat, in his able account of the Andaman Islands (Selections from the Government of India, No. XXV.), maintains quite a contrary view of this subject, as is shown in his preface, where, writing about the Andaman Islands, he says—"They are collections of islands surrounded by most dangerous coral reefs, which are gradually forming innumerable islands, as each becomes lifted above the surface," &c.

Dr. Von Liebig (in the same Records, p. 127) points to a probable rising of Barren Island, recording thus—" One of the most remarkable amongst these was a stratum of rounded stones, like large pebbles, cemented by tufa, exactly like those of the present beach, but at a considerable elevation (about 20 feet) above the high water-mark, showing that the sub-marine base of the island must have been raised since those pebbles had been washed by the sea."

Dr. Playfair (c., p. 123), however, says—" I could not, after very careful examination, satisfy myself that there had been any recent upheaval of the islands, none of the rocks exhibiting signs of having been water-worn."

It may be remarked that Barren Island is an active volcano, and, therefore, rising and sinking can take place here as a local phenomenon.

From a practical point of view, the fact of a sinking state is of importance, as we see all along the shores small fertile valleys opening towards the sea, and preparing themselves gradually for mangrove swamps.

Suppose the gradual submersion to be one foot in a hundred years (which is rather a low estimate), we should see in a thousand years all the stores and houses along the beach at Ross Island submerged, while Middle Straits and so many harbours now dangerous would become open for navigation.

10. The temperature during April was very regular, ranging from.

86° to 87° at 6 A. M., to 91° at 1 P. M., in rare instances rising as high as 92°. During the night the thermometer sank to 85 and 86°. The atmosphere appeared tolerably dry. As, however, I had no instruments at my disposal, I could not make any observations of the amount of moisture it contained.

About the 10th of May the regular rains set in with great force, and after that date there was scarcely any day without some heavy showers. The atmosphere became more and more saturated with moisture, the nights became cool, and the thermometer stood sometimes as low as 78° towards the morning, rising at midday to 80 and 81°. The temperature was commonly 82 to 84° at 1 P. M., but it rose quickly to 90 and 91° whenever a few hours of sunshine prevailed.

In June, the rains became heavier, and thunderstorms were frequent at all hours of the day. The saturation of the atmosphere was then great. The temperature at about 6 A. M. generally was as low as 74°, but often only 73° or even 72°, rising to 82° and 83° at 1 p. M., and sinking to 78° and 79° during the night. In the latter half of this month, the heat increased, the thermometer indicating a mean height of 80.7° in the mornings, 83.7° at midday, and 81.1° in the evening. The showers during May and June were rarely of long duration, but came abruptly with great force at short intervals. I counted during 12 hours of daylight on the 18th June not less than seven heavy showers.

In the first half of July, the heavy rains ceased, and several fine but cloudy days occurred alternately with rainy ones. The temperature decreased

to 78.9° in the morning, 82.0° at midday, and 80.6° in the evening; during the night I observed the thermometer to fall as low as 78.3°.

I was informed that this weather continues till the latter half of December, when the rains become lighter, though they occur from time to time even in January and February.

If this statement is correct, the dry season, therefore, would comprise only four months. I was also told that, since clearings have been effected, the commencement of the rainy season has been retarded for nearly half a month.

It would be highly interesting if the meteorological observations made by the medical officers in the Andamans were made public, as our knowledge of the meteorology of these islands is very imperfect.

The following table shows some of my thermometrical observations; the remainder of which, I am sorry to state, has been lost by accident:—

M			0				
TAT	onths.		6 л. м.	1 P. M.	8 P. M.	Night.	
29th May 30th ,,	* * *		73· 77·	 84•5	5 0 >	9 4 4	Heavy rain. Rain.
,,	0 * *	•••		0.40	•••		ivalu.
15th June	0 Q 0		78.0	81.0			Ditto.
16th ,,			77.0	82.5	0 0 0	0 T 0	Ditto.
17th "	000		81.5	82.5	81.5		Ditto.
18th ,,	0 0 1		79.0	85.0	80.3		Ditto.
19th ,,			81.5	83.2	77.1	• • •	Ditto.
20th ,,	9 6 8	• • • •	80.0	05 5	83.2	4 4 1	Heavy rain at midday.
21st ,, 22nd ,,	9 0 0	* * *	83·0 82·0	85.5 81:0	83.0	* # *	Rain.
92-4	\$ 0 4	• • •	79.2	80.5	77·0 81·2	• • •	Heavy rain.
0.44%			81.0	85.0	83.0	82.8	A little rain only.
25th ,,			82.2	84.4	83.5		Ditto.
26th ,,	0 0 9		80.6	85.0		•••	Some showers during night.
27th ,,	0 0 0		82.2				A little rain only.
28th ,,	0 0 0	0 6 0	• • •			0 4 0	Ditto.
29th ,,	0 0 0	9 0 0	84.2	87.8	• • •		Rather fine weather.
30th ,,			79.8	85.0	7 0 4	100	Rain.
	Mean	6 9 6	87.7	83.7	81.1	82.8	Rain and south-west wind prevailing.
1st July			83.0				Rather fine weather.
2nd "	0 * *		79.5	85.0	81.2	***	Rain.
3rd "	0 0 0	000	81.5			1	Rather fine weather.
4th ,,	0.4.4	0 * *	82.2		84.2	en 1	A few heavy showers.
5th ,,	0 0 3		• • •	85.0	82.1		Rather fine weather.
6th "				WO 0		4 • •	Fine weather.
7th "			80.0	78.0	79.5		Rain.
8th "	+ 1 4	* * *	72.8	80.0	79.8	70.0	Fine weather.
9th ,, 10th ,,	0 0 0	0 9 0	76.2	79.5	70.9	79.0	A little rain only. Heavy rains.
m m 17	460	0 y 6	78.2	82.8	78·2 79·5	77·8 78·3	A little rain only.
11th ,, 12th ,,	• • •	* * *	78.2	83.9			Cloudy, but fine weather.
	Mean	0 5 0	78.9	82.0	80.6	78.3	Alternately fine days, south-west wind prevailing.

11. When sailing along the eastern coasts of South Andaman, the General botanical aspect of the island appears as a series of low hills, nowhere higher than 1,200 feet, and covered with dense lofty forests. All the trees show straight stems with a mean height of 100 feet, and often entirely covered by climbing plants, which hang from the summits of the trees like gigantic festoons. Amongst these lianes Dinochloa Tjangkorreh, Entada Purshaeta, Calamus and Dischidia nummularia may be recognized. The straight growth of trees disappears, however, south of S. Corbyn's Cove and along the western coasts, where a more stunted vegetation occurs,—the mean height of the vegetation being about 80 feet. Along the last named locality, the trees show some tendency to bend in conformity with the direction of the south-west monsoon. The verdure, however, appeared to me brighter there. Long tracts can be observed with leaf-shedding

trees; such trees, however, can be detected everywhere in the ever-green forests. These deprive the landscape during the dry season of that tropical verdure which prevails during the rains.

Mangrove swamps, in which *Rhizophora* and *Ceriops*, with their green glossy foliage distinguish themselves, fringe all the little bays and straits. *Phænix paludosa* is a characteristic feature along Middle Straits, *Barringtonia* and *Excoecaria Agallocha* are easily recognised by their red decaying leaves during June and July, also *Lagerstroemia* and *Pterocarpus* by their rich lilac or yellow blossoms. *Mussaenda*, with its snow-white calyx segment, is frequently seen.

A large Crinum, with broad leaves, appears everywhere along the sandy shores, and resembles in habit small plantain trees. In some spots, arborescent Euphorbiaceæ occur, and present a strange appearance. Screwpines and a Cycas of considerable height give a strange character to the whole vegetation, reminding us of earlier geological epochs. Most varied tints of green can be noticed everywhere in the forest masses, and prepare us to expect a most luxuriant and rich flora, which, however, is fully developed only during the rains.

12. The Andaman Islands present much variety of soil and formation, Attempt to divide the Andaman and there is accordingly a corresponding diversity of the vegetation. It is, therefore, necessary to divide the whole into a number of zones and districts, and to treat of the vegetation of these separately. The absolute height above the sea being inconsiderable, does not sufficiently influence the vegetation to necessitate special consideration here. Thus we have to consider the following six divisions only:—

1.—The vegetation of the shores.
2.— ditto of the coasts.

3.— ditto of the central forests.
4.— ditto of the woodless spots.

5.— ditto of the cleared lands.
6.— ditto of the sea.

6.— ditto of the sea.

13. The real vegetation of the shores exter

13. The real vegetation of the shores extends nowhere further inland than half a mile, though some exceptions may take place along the courses of the numerous creeks, which are nearly all bordered by sandy beach of greater or less extent and a fringe of mangrove jungles. The vegetation of the shores is intersected by coast vegetation, wherever the hills slope steeply into the sea.

No Salsolaceæ, or similar strictly saline plants, have been observed by me in this shore vegetation.

The mangrove vegetation, which is especially developed at Mangrove. Bay, Flat Shallows, and along Middle Straits, extends furthest into the sea-The species which form these swamps are nearly exclusively at one place Bruguiera gymnorhiza, at another Rhizophora mucronata, and conjugata, with Ceriops Candolleana. These last three kinds advance furthest into the sea, and appear as a low dense hedge, fringing the shores with their vivid green leaves, and are often accompanied by the glaucous-looking Sonneratia acida, and apetala; Bruguiera establishes itself behind these, becoming higher and stronger as it occurs further from the sea, until it attains its highest perfection where fresh water influences its growth. There the trees attain the unusual height of 70 to 80 feet, with a girth of upwards of eight feet. Carapa obovata is the most curious tree amongst these mangroves, and to be seen nearly everywhere, often quite covered with the still more curious Hydnophytum formicarum, the tubers of which sometimes attain an enormous size.

Orchids are most developed in this region: amongst them deserve notice for their frequency Eria Kurzii, Pholidota imbricata, Dendrobium crumenatum, Oxystophyllum, Cleisostoma, Cirrhopetalum Andersonii, and Bolbophyllum.

A Dischidia and a Hoya are nearly the only predominant climbers here. A few mosses and Jungermanniaceæ, as also a great number of cortical lichens, sometimes cover the rough bark of the trees.

In most places, no other trees are seen growing with these mangroves; but in others, chiefly along the borders of the swamps, Ægiceras majus, Avicennia tomentosa, Sonneratia acida and apetala, Lumnitzera racemosa, Scyphophora hydrophyllacea, and some others may be met with. Acrostichum aureum occurs here in great abundance. A coarse glaucous Cyperus, Acanthus ilicifolius and A. ebracteatus are almost the only phanerogamic perennials I observed actually in the swamps.

Along Middle Straits, on both shores, *Phænix paludosa* and *Licuala paludosa* make their appearance unexpectedly, and in great abundance. These palms grow there sometimes amongst the *Rhizophoræ*, though their natural station is behind them. Here also a coarse new *Fimbristylis* (*Fimb. Andamanica*) is very abundant, but I found it nowhere else on these islands.

Bordering the mangrove swamps (but along a great part of these islands directly bordering the sea, where mangroves do not grow from the steepness of the shores) a small zone of shore vegetation appears, which may be briefly designated a beach vegetation. This is confined to places where loose sand and rubbish of corals have been washed out by the sea, forming small beaches along the coast.

The principal vegetable forms in these regions are Thespesia populnea, Hibiscus tiliaceus, Pongamia glabra, Erythrina Indica, Guettarda speciosa, Heritiera littoralis, Dalbergia sp., Jambosa, and Pandanus verus in abundance, and Cycas Rumphii occasionally, several white-flowered species of Pavetta, Intsia, Cynometra bijuga, Peltophorum ferrugineum, Nipa fruticans along the courses of the creeks; Barringtonia speciosa, Mimusops Indica in stunted specimens, and Calophyllum Inophyllum sometimes of enormous size. Besides these and others, a few leafless stunted trees were visible which I was unable to recognise.

Excecaria Agallocha presents sometimes a peculiar appearance, with its red colored deciduous leaves, especially along the muddy creek on Middle Andaman, and can be seen some miles distant from the sea. Shrubs of Atalantia monophylla with two species of Capparis occur, preferring situations where a rocky soil is prevalent; Scavola Kanigii can easily be recognised by its yellowish green leaves. Colubrina Asiatica and Guilandina Bonduc, as also Casalpinia nuga are troublesome thorny shrubs.

South of Corbyn's Cove arborescent *Euphorbias* (*E. trigona* and *epiphylloides*) give a strange aspect to the character of the vegetation.

Ipomæa campanulata, Calamus, Asparagus, Mucuna gigantea, Brachypterum scandens, several kinds of Vitis and Entada Purshæta are the climbing species I chiefly observed here.

A Crinum (G. toxicarium) is common all along the coast. A composite (Wollastonia scabriuscula) is the only herbaceous plant, it covers the surrounding shrubs in great abundance. Eranthemum album and Dædalacanthus suffruticosus occur very frequently, but seem only descended from the more inland regions.

Near the sea, on the whitish sand, patches of a coarse creeping grass (*Ischaemum muticum*) and some creeping *Phragmitoid* grass are frequently met with. *Ipomæa pes capræ* is here a remarkable feature, with its shining dark green leaves.

The species of epiphytic plants are not so numerous in this region, and are restricted nearly to the genera Æschynanthus, Dischidia, and Hoya. A few orchids, as Cleisostoma, Saccolabium with Dendrobium crumenatum occur

Polypodium quercifolium covers in great profusion the branches of the trees which are standing near the sea, and is often accompanied by several orchids. No palms occur here, except a few Calami.

14. Another vegetation now presents itself behind this zone of the shores, and is rather less monotonous in character, owing to the diversity of the surface and of the soil. This is the vegetation of the slopes of the hills and valleys influenced by the sea.

It is, so to say, a combination of the flora of the interior parts and of the shore-vegetation favored by the greater moisture, so that here plants may be found which until now are known only from more southern parts of India, as Freycinetia, Anaxagorea, Dinochloa, &c. The greatest variety of species is found in this zone. Here I had always the most favorable botanical harvests during May and June; and whenever I penetrated to the interior, I scarcely could find any species except herbaceous plants and shrubs which I had not seen already in this region.

This coast vegetation may range from three to four miles in breadth, but nowhere can any real limits be traced here. There is also no uniformity in the character of these forests themselves along their whole extension, but they change as soil and surface become different. To treat of them more easily, they may be brought under the three following heads:—

A.—Evergreen forests.
B.—Leaf-shedding forests.
C.—Bamboo jungles.

In the following pages, I shall try to give as correct a picture of these several forests as the short period of my stay allowed me to observe them. I must remark, however, that such forests are not always so strictly separated in nature. Many tracts may be found where leaf-shedding and evergreen forests are growing nearly equally mixed together, or even intersected by bamboo jungles. This, however, does not diminish the value of my proposed classification.

The evergreen forests are most extensive on these islands. Trees, however, exist in such a quantity in all the valleys
bordering the sea, that I am obliged to treat these
evergreen forests under two separate divisions. These are—

(1.)—The kuppalee forests. (2.)—The mixed forests.

- (1.) The kuppalee forests occupy nearly all the months of the creeks and the level lands along the coasts behind the beach and the mangrove swamps. They consist in some places nearly exclusively of Mimusops Indica (called kuppalee-theet by the Burmans, which means tree of the Andamanese), which is a tree ranging from 70 to 80 feet, by a girth of 12 to 14 feet, and growing up as straight as a Dipterocarpus. The finest forests of this species are along the western coasts at the Labyrinth Islands and at Macpherson's Straits. Calophyllum Inophyllum, and Hernandia, and also Macaranga Indica often associate themselves, and a few other kinds of the surrounding forest trees occur in a less number. Hemicyclia Andamanica is often associated (as at Macpherson's Straits) in a nearly equal proportion with the kuppalee trees. Such forests are rather free from all kinds of climbers, and the prickly canes (Calami) occur only along their margins.
- (2.) The tropical mixed forests now begin around these forests, but they also commence immediately beyond the sea-shore zone where the ridges rise abruptly from the sea. Here it is that the traveller has the most difficulty in forcing his way, from the great number of climbers. The typical tree is Dipterocarpus lævis, after which follow as the principal trees of these forests, but prevailing in one locality more than in another, Dipterocarpus alatus, Mesua ferrea, Lagerstræmia hypoleuca, Pterocarpus dalbergioides, Irina glabra; and another species, Dracontomelum sylvestre, Albizzia Lebbek, Adenanthera Pavo-

nina, Podocarpus polystachya, Eriolæna aceroides, Rottlera tinctoria; two or three kinds of Calophyllum, Ficus laccifera, Spondias, Careya sphærica, Barringtonia, Artocarpus Chaplasha, Fagræa morindæfolia, Vitex leucoxylon, &c., &c.

There often appears a group of leafless Bombax Malabaricum, Tetrameles nudiflora, and some other leaf-shedding trees.

Along the western parts of South Andaman, Harpullia cupanioides (of a large size), Elæocarpus robustus, Walsura, and numerous species of Ficus prevail, owing to the greater moisture.

Under the protection of these lofty trees smaller trees occur in great abundance, amongst which the following deserve notice for their frequency:—Three to four kinds of Myristica, the delicate Baccaurea sapida; three species of araliaceous trees, Mangifera sylvatica; two kinds of Pisonia; Bouea oppositifolia; two arboreous Cordyline, Pandanus Leram, Polyalthia Andamanica; several Tetrantheræ and Euphorbiaceæ, Garcinia; a large flowered Mussænda; and a number of other rubiaceous trees.

The shrubby underwood is rather dense, but all these shrubs look very weak and slender, showing a tendency to run up. It is difficult to classify them under any general description, but I shall have an opportunity hereafter to call attention to the presence among them of botanical centres of particular species.

The most frequent forms, however, which are present in all parts of these Islands are Claoxylon, Rottlera, Glycosmis pentaphylla, Jambosa, Epicarpurus orientalis, Ardisia, Alsodeia Bengalensis, Unona longiflora, Anaxagorea Zeylanica, Serissa ternata, several white flowered Pavettæ, Croton umbellatum, Marcreightia Andamanica, Grumilea elongata, and several others.

The prevalence of Anonaceæ, Rubiaceæ, and Euphorbiaceæ, though varying very much with regard to species, is so marked, that we might fairly estimate two-thirds of the whole shrubby vegetation to consist of these families.

The climbing vegetation comprises, in the first place, Dinochloa Tjankorreh; three kinds of formidably armed canes; Ficus; several species of Vitis; Thunbergia laurifolia; a thorned Griffithia, Uvaria Sumatrana, Toddalia sp., Zizyphus Oenoplia and Z. glabra; several kinds of Menispermaceæ; two species of Scindapsus, Uncaria pilosa, Freycinetia radicans, Modecca, Ancistrocladus extensus, Buettneria, Capparis; several Cucurbitaceæ; Brachypterum scandens, Entada Pursuaetha, Flagellaria Indica, Chavica, Gnetum scandens, &c., &c. In general, it seems that nearly every family has its respresentatives among these climbers, which make some parts of the islands, especially along the ridges, nearly impenetrable.

Epiphytical orchids are rather rare in these forests, and are mostly confined to the upper parts of the trees.

Palms are numerous; amongst which Licuala peltata and Areca triandra are the commonest. On Termoklee Island a gigantic but stemless Corypha,

with leaves nearly 30 feet long, presents a most striking appearance.

The herbaceous annual and perennial vegetation is, during the dry season, exceedingly scanty, and nearly confined to a dozen species; Bragantia tomentosa, Abrus precatorius, Eranthemum album, Dædalacanthus suffruticosus, Hemiagraphis glutinosa, Hypolytrum, Cyperus moestus and Pandanophyllum zeylanicum, are the most remarkable ones; Elatostemma sesquifolium and Maranta Indica are often seen.

Musa (Simiarum?) Amorphophallus longistylus, Alocasia fornicata, Phrynium parviflorum, and another small species, Costus speciosus, Amomum aculeatum, Zingiber cassumunar, Curcuma Roscæana; several terrestrial orchids Aclisia Indica, Aneilema ovatum, Ophiorrhiza, Ophioxylon, and some others appear principally during the rains.

The only real annuals during the dry season are *Urena lobata*, *Blumea virens* and *Blumea myriocephala*, which, however, are too rare to need consideration here. The soil during this season is everywhere exposed, and looks quite barren along the eastern coasts, where few plants, except seedlings of the surrounding trees, are found.

During the hot season, tracts of forests may be observed principally along the coasts, which are quite leafless, and, therefore, presenting a greyish sterile aspect. They consist, for the greatest part, of large sized and straight trees, mostly of small utility. The principal species, which more or less prevail, are Bombax Malabaricum in abundance; several kinds of Sterculia, Nauclea sp., Odina wodier, Calosanthes Indica, Pajanelia multijuga, plentiful, Terminalia procera and bialata, Albizzia Lebbek common; Ficus infectoria rare, Gyrocarpus Asiaticus, Canarium euphyllum, Cordia sp., and others.

In June, when all these trees begin to put out their leaves, such forests are still peculiar in their aspect from the different tints of brown, yellow and red which are produced by their young leaves. Later in the season, the trees may be recognized by their hemispherical large crowns, and the bright green of their foliage. Owing to the little shade they give during the hot season, climbers are much scarcer in these forests, and even disappear altogether in some localities; the shrubs are confined to a small number of wide range, and the herbaceous plants are reduced nearly to *Eranthemum*, and sometimes *Dædalacanthus* and *Bragantia*. No climbing *Aroideæ* grow here save *Pothos scandens* in a stunted condition.

During the rains, however, and especially along the western coasts, a number of small herbs, as *Begonia Andamanensis*, *Ebermayera velutina*, *Leea*, *Ophiorrhiza*, &c., develop themselves.

Here and there some evergreen tree may be observed belonging to Sapin-daceæ, or even Dipterocarpeæ; also Artocarpus chaplasha, Ficus laccifera, and Erioglossum edule are not uncommon.

The immense buttressing of the stems is noteworthy. Trees of 12 feet girth, a short distance above the ground, may have a girth of nearly 40 feet near the surface of the ground.

Such leaf-shedding forests occur principally south of South Corbyn's Cove, north of Chatham Island, at Mangrove Bay, around Port Mouat, and in greater extent at Shoal Bay and on Middlle Andaman.

The bamboo jungles occupy principally both shores of Middle Straits, the lands north of Watering Cove, Shoal Bay, &c., only here or there interrupted by forests of the other classes. They occur, however, in all parts of South Andaman and Labyrinth Archipelago to a greater or less extent.

It is highly interesting to observe the connection of the bamboo jungles with the indurated chloritic rocks. I observed everywhere on these islands that, wherever bamboo jungles exclusively covered tracts of land, I could conclude with certainty that chloritic rock or serpentine was present, often only indicated by the many quartz pebbles in the soil.

The mean height of these bamboos may be about 30 to 35 feet, and they consist nearly entirely of a single species, Bambusa Andamanica.

They are very easy to penetrate, as climbers and shrubs are comparatively scarce. Lofty forest trees occur only at great distances from each other (on an average perhaps from 90 to 100 feet), and belong generally to the same species as of the other forests, Dillenia aurea, Careya sphærica; several Acacias, Pterocarpus dalbergioides, are those which I noted as most abundant.

All these trees, when seen afar from the sea, stand out from the bamboos like slender palm trees from a low jungle.

In these bamboo thickets Scleria lithosperma occurs abundantly in some places; Pteroloma triquetrum, Geophila, Elatostemma sesquifolium and several Scitamineæ are frequently met with.

The bamboo itself which forms these jungles is very variable as to size and habit, and nearly useless, the wood being very thin and soon decaying. A larger kind of bamboo will probably be found south of South Corbyn's Cove, with culms nearly six inches in diameter, and of somewhat stronger quality. I myself, however, did not come across the growing plant; and I became aware of the existence of this species only from pieces of bamboo which I found occasionally around the camping places of the Andamanese.

15. After having penetrated through these coast zones, we see the quantity of intricate climbers diminishing, and a greater uniformity of the vegetation appearing; the luxuriance, however, remains nearly the same. The whole of this central region remains still a terra incognita, as I entered it for a few hours only.

The chief trees observed there were Dipterocarpus laevis; Dracontomelum, two species of Irina, Walsura sp., Ternstræmia penangiana, Bassia caloneura, Artocarpus chaplasha and Chickrassia tabularis; also Garcinia, Mangifera, Myristica and Murraya exotica appeared most common. The principal shrubs were chiefly Alsodeia bengalensis, Unona longiflora, Grumilea elongata, and another hairy species, but the preponderance of the various species changes, even as in the other regions, with every mile of progress.

The climbers were principally *Dinochloa Tjangkorreh*, and several species of *Vitis*; *Calamus* appeared less prickly, and only on some spots formed really impenetrable masses.

Pandanophyllum Zeylanicum, Hypolytrum, Eranthemun album, Bragantia tomentosa, Clerodendron, some dried up Acanthaceæ, several terrestrial Orchideæ, Scitamineæ and Musa were common. Epiphytical orchids are rare here; Aroideæ are, however, frequent. Asplenium nidus is the most common fern on the trees, as Acrostichum setosum is on the ground.

In the interior parts, north of Port Blair, bamboo seems to form the most extensive jungles, and to form a broad strip, interrupted occasionally by other jungles extending from the centre in a north north-east direction to Middle Andaman, following the formation of the chloritic rocks.

16. The woodless spots are confined on South Andaman to Bird Vegetation of the woodless spots.

Islands near Viper and to the Bird-nest Cape at the entrance to Macpherson's Straits. There treeless rocks rise abruptly from the sea nearly vertically, and are completely exposed to the influence of wind and weather, so that only shrubs and perennial plants can sustain themselves along the barren precipices, which are nearly destitute of humus even on the ridges.

The vegetation there (in May), however, was nearly quite burnt up by the scorching sun, and the whole appeared thorny, rugged, and of a brownish color. I could recognise only a few species when I passed this place, endeavouring to save my life after being stripped of everything by the robbers who attacked me.

A Fimbristylis, with narrow stiff leaves, is common there, especially near the sea; also two or three Andropogonous grasses, which formed extended patches; some of these are prostrate grasses measuring two or three feet in length. Plecospermum spinosum, Harrisonia Brownii (?), Capparis sepiaria, Atalanta monophylla, and a number of half-withered leafless shrubs appeared upon the rocks.

The large number of orange-red fruits of *Trichosanthes palmata* produce a most agreeable effect on Bird Island, and look like a number of bright balls hanging from the rocks; at this place a coarse *Cyperus* is also common.

Barren Island, which I did not visit, belongs partially to this section.
As I observed the grasses occurring on it, which were brought by the deputation

sent from Port Blair to search for pasture ground or wild grasses, belonging to Andropogonous genera. As these were the only plants collected there by the deputation, I cannot judge of the general character of the vegetation of that island.

17. We have now to consider the vegetation of the cleared spots and cultivated lands where the most recent change in Vegetation of the cleared lands. the flora of the Andamans has occurred. Such spots appear during the hot season as yellowish ridges, destitute of nearly any vegetation, except what is the direct result of cultivation. During the rains, however, and even in some protected spots also during the hot season, a number of weeds spring up, which have been introduced with the different sowings of grass made around the settlements. Stachytarpha Indica and Angelonia salicariæfolia have become troublesome weeds on Ross Island; Scoparia dulcis, Vernonia cinerea, and Ageratum conyzoides are now the most common weeds in these settlements, and some of them have already penetrated far into the jungles, especially wherever a little clearing or even cutting has taken place, numerous grasses and Cyperaceæ are growing now freely, which originally had been sown, and in some spots in the forests they appear as if wild. Cynodon Dactylon, the common doob grass, is springing up vigorously, covering the ridges with a thin but brilliant emerald green. A shrub, Lantana mixta, already occurs locally in the jungles around Aberdeen. Papaya vulgaris will most likely become in a short time quite established, and will spread spontaneously.

18. Omitting the vegetation of fresh waters, which in the Andamans only is represented by a few Algæ, we have finally to note the vegetation of the sea. The only phanerogamous plant I observed was *Enhalus Kænigii*, which is rather common along the western coasts and the Labyrinth Islands.

19. I must here notice the difference of the aspect of these forests and Influence of the seasons upon the cultivated lands in the latter part of the dry season vegetation.

(April and May), and during the rains (June and July).

I have already dwelt generally upon this subject in the previous sections on the vegetation of these islands.

In April and May we find few other species in flower than such as have more or less a continental geographical distribution, as Sterculia, Albizzia Lebbek, Pajanelia, Dillenia, Careya, Odina, Glycosmis, &c., also generally such as are destitute of their leaves during the hot season. The climbers put forth all their variously colored flowers high in the summits of the trees, quite out of the reach of man. Numerous dried-up perennial and annual plants and leafless (often thorny) shrubs fail to give the forests the appearance of tropical luxuriance.

The shrubs, though numerous, appear of such an uniform habit in consequence of the prevalence only of a few families that those not acquainted with botany might easily refer them altogether to some 20 or 30 kinds. Only a few produce conspicuous flowers.

A fortnight or so after the rains have set in a new life begins, the former leafless trees appear in bright green, the numerous pinnated leaved trees belonging to Sapindaceæ, Meliaceæ, Burseruceæ, Anacardiaceæ, and numerous families of a more southern vegetation, all vie to be the first to develop their buds. The herbaceous plants, formerly nearly disappearing from drought, occasionally cover in single or few species the freshly moistened soil. Scitamineæ form now the principal feature, intermingled with Pollia, Leea, Ophiorrhiza, &c.

All vegetation takes a more Malayan type, and we often do not recognise again the spots which we passed during the dry season, when they were nearly barren and the yellow clay soil was covered only with dust.

Such a change, however, is not only confined to the flora, but affects also the fauna. Frogs and toads are now croaking; snakes appear more numerous; snails are plentiful on the wet stemsand leaves; fire-flies, before nowhere seen, appear, though in a moderate number, giving a dusky light, and cicades loudly chirp. But a swarm of pests accompany this delightful change, and whole hosts of musquitos, horse-flies, gnats, sand-flies, &c., in company with leeches, abound.

20. The botanical features, as given above, evidently show that the Andamanese flora generally a Malayo character of the Andaman flora is a Burmese one, altered by some unfavorable agencies, principally the scarcity of running waters; and favored at the same time by its insular position and narrowness, a number of Malayan types grow here, which are not yet recorded from the opposite continent.

I had only a few minutes' stay at Diamond Island in Pegu; but I was struck, when afterwards coming to the Andamans, by the similarity, nay rather identity, of the shore vegetation. A few Ceylon species indicate some relation between the Andamans and that island. Most of the species, as far as I have been able to collect, do not differ from those already known from the Burmese territory (principally Tenasserim), or which are preserved unpublished in the Herbarium in the Botanical Gardens, Calcutta.

21. The peculiarities of the flora do not consist in the presence of many peculiarities of the Andamanese new and rare species, but rather in the absence of well known, and in the surrounding countries exceedingly common, forms. As examples, I may quote Saccharum spontaneum, Imperata arundinacea, Vernonia cinerea, Gleichenia dichotoma; most species of Grewia, Blechnum orientale, Lycopodium cernuum, Selaginella, Hydrocotyle Asiatica, Helicteres, Polygala, Pterospermum semisagittatum, Quercus, Crotolaria, Indigofera, and numerous others.

The disproportion between the genera and species in favor of the former is another fact worthy of mention, though it may happen that this inequality may be greatly reduced after the whole of the islands have been thoroughly explored. Already, after the first rains had set in, a number of species could be referred to genera which appeared to me during the dry season to consist of but a single species.

The astonishing profusion of individuals of single species, though not so evident when visiting only a few localities, is another fact deserving mention. Nearly two-thirds of all the species enumerated in my list occur in one or other locality in great numbers; comparatively few have been observed as single plants only, perhaps because I had not reached their centres.

As the most important deficiencies in the flora of the Andaman Islands in comparison with the Burmese one, of which it must be considered to form part of, I may sum up—

- (1).—Total absence of Magnoliaceæ, Onagrarieæ, Umbelliferæ, Vaccinieæ, Antirrhineæ, Labiatæ, Polygonaceæ, Amarantaceæ, Salsolaceæ, Cupuliferæ, Coniferæ, Pontederiaceæ, Hypoxideæ, and a number of smaller families.
- (2).—The absence of Nymphæaceæ, Halorageæ, Lentibulariaceæ, Najadeæ, Lemnaceæ, Hydropterides, Ricciaceæ, and all other freshwater plants is in accordance with the scarcity of water during the dry season.

It would be important to determine whether during the latter part of the rainy season short-lived water-plants would not spring up, as I observed already

in July fine patches of fresh water Algæ in the creeks north of Watering Cove.

- (3).—The scarcity of Melastomaceæ (2 sp.?), Tiliaceæ, Gesneraceæ, Solanaceæ (1 sp.), Urticaceæ (1 sp.), Ternstræmiaceæ (1 sp.), Begoniaceæ, (1 sp.) Piperaceæ, Aroideæ and Aspidieæ.
- (4).—The extreme scarcity of annual plants and of so called weeds beyond Port Blair is undoubtedly a most remarkable feature in the Andamanese flora.

All the weeds enumerated in my list are evidently of late introduction, and, therefore, cannot be treated as elements of the flora. Wherever clearings take place the soil remains barren, and only Acanthaceæ, shrubs and other woody plants come up, with which Vitis, Leea, &c., are associated during the rains.

Scarcely any indigenous weeds are seen on such spots, but numerous introduced weeds appear in localities which are protected, or in the valleys; amongst these Scoparia dulcis, Ageratum conyzoides, Vernonia cinerea, and several Cyperaceæ occupy the first place.

The great number of introduced plants already appearing almost indigenous, in spite of the short time of our occupation, will be easily understood when we recollect that extensive sowings of grasses, &c., have been made all around the stations within the last few years, so that the originally barren yellowish ground is covered with an agreeable verdure during the rains. When drawing our attention from the deficiencies, and directing it to those forms quite peculiar to the islands, and to those families best represented there, we perceive that, with regard to the latter, the Andamanese flora has but little peculiarity in comparison with the Burmese and Malayan floras.

As a few examples of apparently peculiar forms in the Andamans, but not yet known from Burmah, I can note Freycinetia, Mimusops Indica, Anaxagorea Zeylanica, Hydnophytum formicarum, and a number of the species, now described by me as new. But even these forms cannot certainly be pronounced peculiar, as I feel sure that many of them will be collected in Burmah at some future time; moreover, the Burmans in the Andamans know most of them by name.

22. It is important to know the flora of the Andaman Islands in all its Importance to distinguish introduced completeness as soon as possible, as the increasing clearings and subsequent cultivations have already caused a number of introduced plants to become as if they were indigenous, so that it is only possible to declare a species really introduced after having explored the surrounding regions.

All our inquiries into the laws of distribution of plants depend chiefly upon the knowledge of unmixed floras, and the Andamanese vegetation is probably the only unmixed one existing in tropical Asia.

I may remark here that Mr. Homfray himself has informed me that he has made many sowings of different species, as Canna, Mirabilis, &c., in the interior of the jungles.

23. A considerable number of plants appear on the Andamans centres of species of plants. concentrated on one or more spots, where they occur in great abundance, diminishing in number of individuals, or disappearing altogether as we remove from their centres. Such spots may be called botanical centres of species.

A species may, therefore, occur in great quantity over a certain space, but be found nowhere else. In other instances, a species may occur at a spot in great quantity and disappear to make place for another prevailing type, but it may make its appearance again under similar circumstances at some other spot.

Such centres are especially well marked in perennial and herbaceous plants, somewhat also in shrubs, but in trees less so, though among them similar laws must be in force, when we consider the great variance in the prevailing types in the different localities.

I was long inclined to ascribe these changes to the different soil, but afterwards I became convinced that this was not the sole cause, though it cannot be denied that the influence of the different geological formations on the limits of the centres is a very marked one everywhere.

The whole flora of the Andamans, therefore, must be a very primary one, and could never have been influenced by the agency of man. Malayan prows come during the north-east monsoon for fishing and catching trepangs, and might have accidentally introduced a certain number of plants along the sea shores, but I saw no evidence of such a fact.

Around Port Blair and the Penal Stations, where clearing of the jungles and cultivation have taken place, we may observe similar but smaller centres of certain introduced plants, which are now rapidly increasing and spreading ever the whole land so far as clearings are carried; they do not extend as yet into such parts of the jungles which have never been trodden by Europeans. It is therefore interesting to see that the extension of weeds and other introduced plants does not yet reach anywhere a greater distance from culture than a mile or so. The cause evidently is that the woody region does not suit them.

Along the shores the presence of such centres is the more striking, as we can there easily determine their extent. As interesting examples, I note here Euphorbia epiphylloides, which extends on the serpentine rocks from the Bird-nest Cape as far as the opposite ridge at Escape Bay in Macpherson's Straits, about two to three miles distant; it does, however, not go further inland than perhaps a thousand paces. This species seems to be peculiar to this spot, and to exist nowhere else on South Andaman. Euphorbia Atoto occurs in the same Bay on the sandy beach, as between South Point and S. Corbyn's Cove. Its centres are, however, exceedingly small. Euphorbia trigona also is restricted to the reddish serpentine, and appears on a ridge, extending from the southern side of the creek land inwards, thus following that formation.

The most puzzling fact, however, is that commonly several species which do not occur elsewhere have their centres at the same place, a careful examination of such localities did not show me any peculiarity of configuration or soil; I therefore am inclined to believe that they have retreated as the sea advanced. It may be said that the seeds had been washed to the shores by the sea, which for some species really might be the case, where the nature of the seeds allows this manner of immigration.

Although it has been proved by several eminent botanists that the germinating power of seeds is capable of preservation for a long period in sea-water, I must confess that I rarely succeeded in obtaining a single good seed amongst the rubbish washed out by the sea along the beaches, and those I found were always of such species of plants as grew along the same coasts. The great obstacles which meet such seeds on their new ground, which is in most cases only suitable for littoral plants, must also be borne in mind. Where level lands border the sea, these commonly are protected against any immigration by the dense mangrove swamps, and also where the coasts are steep; some sandy beach must exist to allow seeds to be washed out, or a rocky ground, both equally unfavorable for the greatest bulk of tropical plants. Other cases, I suppose, (considering only Virgin Islands,) do not occur in tropical Asia, as pastures, &c. There are reasons, too, to presume that rising lands, which owe their vegetation to the spreading of species from their interior, are more suited to such an immigration by sea than sinking ones.

As a strong argument against my opinion of the over-rated importance of immigration by causes here spoken of, I must remark that sometimes large pieces of bamboos, measuring often $2\frac{1}{2}$ feet in circumference, and belonging evidently to Bambusa gigantex, have been met with by me not only along the eastern but also along the western coasts. This makes it probable that they have come from the direction of the sources of the Irrawaddee, north of these islands. The length of time, however, these woods have travelled to reach the Andamans cannot be made out, as we possess no knowledge of the preservation of bamboo in sea-water.

It may also be presumed that the decaying of vegetable matter and the power of seeds to retain vitality must differ in different climates. Hence it is that temperate species become acclimatized so easily even in tropical countries, while tropical species rarely enter into the temperate zone.

The following are some examples of centres, as far as I remember. I understood the distribution of the plants on the Andamans only after having traversed several entire tracts of these islands, and therefore the data are very meagre. I must remark that I do not include such species as are new to science, or are restricted to a few specimens, but only such whose frequency and nature of occurrence allow me to call them centres.

Mesua ferrea around Aberdeen and opposite and around Mount Harriet as the second prevalent type of the forests there.—Sandstone.

Harrisonia (Brownei?) at Bird-nest Cape only.—Serpentine rocks.

Leea acuminata? Wall, north of Mangrove Bay and Watering Cove.— Indurated chloritic rock.

Carapa Moluccensis, shores north of Port Mouat.—Sandstone.

Pteroloma triquetrum, north of Watering Cove in bamboo jungles.—Indurated chloritic rocks.

Melastoma (Malabaricum?) ridge near South Point.—Sandstone.

Sonerila sp.? rocky places, north of Watering Cove.—Indurated chloritic rock.

Lumnitzera racemosa, Middle Andaman at Middle Straits.—Indurated chloritic rock.

Begonia Andamanensis, Parish, on a ridge at Port Mouat.—Sandstone.

Mæsa ramentacea, Viper Island.—Sandstone.

Bassia caloneura, north of Watering Cove.—Indurated chloritic rocks.

Acanthus ebracteatus, Phœnix Bay (Sandstone); Middle Andaman (Indurated chloritic rock); Port Mouat (Sandstone).

Ebermaiera velutina, on a ridge at Port Mouat.—Sandstone.

Clerodendron squamatum, Vhl., north of Watering Cove.—Indurated chloritic rock.

Cassytha filiformis, Shoal Bay and Crab Island.—Sandstone.

Euphorbia Atoto, Macpherson's Straits and South Point.—Serpentine rocks.

—— epiphylloides, Escape Bay.—Serpentine rock.

—— trigona, South Corbyn's Cove.—Serpentine rock.

Licuala paludosa, Middle Straits.—Indurated chloritic rock and Sand-stone.

Corypha macropoda, Termoklee Island.—Indurated chloritic rock.

Tacca pinnatifida, Crab Island.—Sandstone.

Peristylus? on a ridge at Port Mouat.—Sandstone.

Anæctochilus? South Corbyn's Cove.—Sandstone?

Pandanophyllum Zeylanicum, Macpherson's Straits, and on a ridge north of Viper Island.—Sandstone and Serpentine rock.

Fimbristylis Andamanica, Middle Andaman.—Indurated chloritic rock.

C'hloris digitata, ridge at Port Mouat.—Sandstone.

Lindsæa davallioides, on a ridge north of Viper.—Sandstone.

Pteris tripartita? north of Mangrove Bay.—Indurated chloritic rock.

Adiantum lunulatum, on a ridge at Port Mouat.—Clay.

Lygodium sp.—Escape Bay.—Serpentine rock.

24. A considerable diminution, principally of shrubby species, but Proportion of the species along the even of trees, can be observed whenever we leave the coasts to that of the interior. The various trees we see there covered with numerous climbers and epiphytic plants gradually become scarcer in the interior, where *Dinochloa* and different *Calami* become the prevalent features. Orchids, which cover the trees in the mangrove swamps nearly to the ground, occur here only on the highest branches and in a very small number.

To this an exception must be noted, namely, a great part of the forests around Port Blair, which are much favored by the form of the land which is intersected by the sea.

The time, however, was unfortunately too short to enable me to explore the interior satisfactorily, so as to be able to give accurate statements of the proportion of the coast flora to that of the interior. All I can do here is to direct the attention of future investigators to this point.

In considering this apparently gradual diminution of species towards the interior, together with the sinking state of the islands, I am inclined to ascribe the profusion of species along the shore and in the coast zone to a gradual and slow retirement of the different species towards the interior. We may presume that a great number of species, which originally grew on the countries now submerged between these islands, Burma and Hindoostan, have been repelled by the advancing sea, and the vegetation became thus comparatively richer in generic types as the area grew smaller.

Hundreds of species may have been extinguished by this struggle against the sea and subsequent change of climate, or may have been superseded by more durable ones. The great scarcity of perennials and annuals might have originated by the gradual diminution of fresh water as the sea reached the higher ridges of the mountains now submerged.

In Middle Straits, where I already noted that the sinking of the land is well marked, we are enabled at some places to see how the beach vegetation, now submerged, but still recognizable, has retired behind the mangrove formation. North and north-west of Mangrove Bay the gradual transformation of the level lands into mangrove swamps can be easily studied, as also the interesting struggle of non-saltmarsh species against the swamps, and their retirement towards the drier forests. It is not in the power of a traveller to give accurate statistics of such changes, but such investigations must be carried out by local botanists, who are enabled to follow the changes of the vegetation on a tract of land during a long series of years.

25. The number of phanerogamic plants noted by me as really in di-Probable number of phanerogams genous is only 520 species. This, however, is only an approximation to the actual number existing on the islands. The number of species on a square of 100 feet, in a favorable situation in the interior, east from Aberdeen, in May was only 58 to 60, with the following proportions:—

0 1	1	AT	Jungo			
	Number of species.	A,-L	rees.		Number of	individuals.
1.	Dipterocarpus lævis		***	***		17
2.	Prunus Martabanica	***	***	0.4-4	* * *	2
8.	Dracontomelum sylvestre	2	***		4 4 4	5
4.	Fagraea morindæfolia	× = 0	***		444	1
5.	Lagerstræmia sp. (Thit-	phyoo)	4.4.4	4 944	6 4 4	2
6.	Careya sphærica		* * *		0.04	1
7.	Mesua ferrea		4-			7
8.	Garcinia speciosa	6 8 8	***	***	***	1
9.	Artocarpus Chaplasha	e s e	* * *	* * *	6.9.6	2
10.	Myristica Irya	0 0 0	4 + 4	***	.0.0	2
11.	Calophyllum Wallichii	* * *	***	***	1 444	1
12.	Pierardia sapida	4 4 4	0.01			1
13.	Myristica laurina	***	* * *	b. b. a-	4.4.	3
16.	Three small trees not red	eognised	***	***	400	9
						48
		B.—Si	hmihs			20
	Number of species.	D. N.			Number	of individuals.
1.	Diospyros chartacea	0 0 0	6.6.6	***		3
2.	Unona Dasymaschala	***	***	4.6	4	and 5
3.	Oxymitra fornicata	***		***	+ 4.4	1
4.	Pavetta sp., (with white	flowers)	***		C	. 6
5.	Grumilea elongata	***	0 0 0	4.6.6		nany.
6.	Claoxylon sp.			***	p	lentiful.
7.	Trigonostemon sp.					0
8.	Glycosmis pentaphylla	4.0	0 4 0	***	6.44	2
9.	Alsodeia bengalensis	***	0.5.5	*+	••• pi	redominating.
10.	Rubiacea	***	1.4.1	***	0.00	2
11.	Ecdysanthera sp. Croton umbellatum	000		9.4.2	***	2
12. 13.	Sphenodesma unguiculat	2.4.a	8 8 9		F # E	ĩ
14.	Anaxagorea zeylanica		5 * 6	1.4.4	V V V	2
15.	Zizyphus Jujuba	4.8.9	***	4+4	0.00	ĩ
16.	Leea staphylea		**	***	***	ī
20.	Four species of shrubs n					several.
		Palms (ex	cept climber	s).	W 1	ve southern the
1.	Number of species. Areca triandra					of individuals.
2.	Licuala peltata	0.0.0	9.00	***	***	4
3.	Caryota sobolifera	0 0 0	411	***	***	1
0,	out so solitoru	0.5.0	4.6.4	4. 6. 4	***	
						7
	D.—Clim	bers, exclu	ding annual	species.		
	Number of species.					of individuals.
1.	Calamus with black thou		000	***	_	redominating.
2.	Calamus sp. (broad-leav		* * *	* * *	ra	
3.	Calamosagus laciniosus	4.6.8	0.0.0	4.4.4		lentiful.
4.	Ancistrocladus extensus	0 1 E	* * *			veral.
5.	Pothos scandens	4 9 9	(A) (9) (A)	4 4 4		entiful.
6. 7.	Scindapsus pertusus Dischidia nummularia	* + -	5.0.	N 9 4		entiful. veral.
8.	Dinochloa Tjangkorreh	0.0-0	0 = 0	9.4.9		edominating.
9.	Thunbergia laurifolia	* 0 4	444	0.00	70	veral.
10.	Menispermacea		0.0.0	0.00	888 50	1
11.	Vitis glauca		4 7 8		56	everal.
12.	Vitis tuberculata	4.4.4	400			entiful.
13.	Ficus sp.	***	***	***	SC	
14.			***			1
17.	About two or three spec	ies not rec	cognised	0.0-0		everal.
	T)					

E.—Orchids.

Number of species.

1. Dendrobium crumenatum

... Sew.

Number of individuals.
... few.

F.—Perennial and Annual Plants.

	Number of species.			Number of individuals.
1.	A little climbing plant	0 0 6	5 • G	plentiful.
2.	Hypolytrum trinervium	•••		some.
3.	Eranthemum album		• • •	plentiful.

The extension of such a calculation to the whole of the 900 square miles of South Andaman shows that that island can scarcely contain more than 600 or 700 species. Travelling, however, from place to place, and taking into view the great change of vegetation and the numerous unexpected appearances of new forms with which we so frequently meet, the number of really indigenous phanerogamic plants may range between 1,500 and 1,800 species.

A square of 100 feet on the western coast, when carefully taken up, would give quite other results from what I have just shown as the result of such an investigation in the eastern part.

26. Colonel Kyd, in 1791, introduced from the Andaman Islands (most probably from Port Cornwallis) several plants into the Botanical Gardens, Calcutta, which were described afterwards by Dr. Roxburgh in his Flora Indica. Dr. Helfer, when on deputation on these islands, made large botanical collections. He was, however, unfortunately killed by the aborigines; and his Andamanese collections were afterwards mixed up with his Tenasserim plants. The greater part of his collections could not, therefore, be embodied in my list. A few plants have been gathered by Drs. Playfair and Liebig, most of which are contained in the Herbarium of the Royal Botanical Gardens, Calcutta. More recently (in the year 1863, I believe) the Reverend C. Parish, of Moulmein, visited Port Blair and collected plants, but I am unacquainted with his collections. My own collections, though far the richest, will probably be found to be very poor indeed when the whole of the flora is known.

27. Annexed Appendix A is a list of the plants known from these islands, including the Cocos and Barren Islands. I found it useful to mention the native names as far as I could obtain them, and also remarks upon the occurrence of the several species, as I am convinced that a bare list does not give us the impression which we obtain when investigating the vegetation on the spot.

It contains also most of the newly acclimatized and most of the cultivated plants.

Appendix C.* Appendix C contains the descriptions of the apparently new species gathered by me on these islands.

The Cryptogams (except ferns) are only generally treated here. They cannot be determined in India owing to the absence of accurately named specimens.

I have now only further to remark that the species marked before their names with an asterisk are introduced ones; those in small type occur only in a cultivated state; the remainder I consider as really indigenous, i. e., originally present before settlement of these islands.

^{*} Is not taken up in the first edition of this report, and therefore it has been omitted also here. The descriptions will probably be published along with other contributions towards a Eurmese Flora in a scientific journal.

Recapitulation.*

					Indie	TOKE	JS PI	ANTS	•	Intr P	ODUC			Sin	GAPO	RE F	LORA
NAT	JRAL OR	DERS.		Trees.	Shrubs.	Climbers.	Perennials.	Annuals and Biennials.	Total.	Woody.	Herbaceous.	Total.	Total.	Indigenous, woody.	Indigenous, herbaceous.	Introduced plants.	Total,
Dilleniaceæ	4 4 1	6 6 8	a • •	2		1	* * *		3			o 6 0	3	6 2	1		7 2
Magnoliaceæ Anonaceæ	0 + 6		• • •	3	7	2			12		164		12	17			17
Menispermaceæ		• • •	9 0 0			3			3			4 1 9	3	4	1		5
Nymphæaceæ						4 4 1	• • •				111				1		1
Capparideæ	g + 6	4 4 1			2 2	2	***	* * *	4 2		1	1	5	2	1	2	5
Violarieæ		• • •	6.3.4	ī		* * * *			1		* * *		ï	$\frac{1}{2}$	* * *	1	
Bixineæ Pittosporeæ	• • •	0 a 6	• • •	1		1 1 0						111					2
Polygalaccæ	4 4 4	1-11	***	1					1				1		1		1
Caryophyllaceæ		* * *	* * *			1					1	1	1		1	* * *	1
Portulaceæ	6 h 6	* * *	9 7 4		4	* * *		7			2	2	2		1		1
Sesuviaceæ		0 0 0	* * *		1	•••		1	1 2		* * *		1 2	0			3
Hypericineæ Guttiferæ	* * *	* + *		7	1	111	***		8		5 6 8		1	8	***	4 9 9	8
Ternstroemiaceæ	* # 9	g 4 6	0.4.0	li					1	1		* * * *	8	6	* * *	7 4 6	6
Dipterocarpeæ	• • •	0 * *	* * *	6	, , ,	1	6 + 4		7				7	5			5
Malvaceæ	• • •	* * *	8 4 8	4				1	5		1	1	6	4	4	1	9
Sterculiaceæ	* * *	7 4 4		8	74.0	2			10		• • •		10	3	1 2	***	15
Tiliaceæ	0.4.6		F 1 4	3	1.	4	* * *		4	1	* * *	2 g h	4	13 2			2
Linaceæ Malpighiaceæ	* 4 *	* * *	• • •	111	1	1			2		0.00	0 0 0	2		i	6 9 4	ī
Oxalideæ	8 6 9	0.4.0		• • •							1	1	1	1	1	1	2
Balsamineæ	* 0 *	* * *				1					1	1	1		1		1
Rutaceæ	* * *	***	449	3	2	2	,,,		7		• • •		7	6	406		6 3
Simarubaceæ	4 4 9	* * #	***	1	1	0.4 0	* * *	***	2 1		***	• • •	2	3	***	* * *	4
Ochnaceæ Burseraceæ	0.0 0	• • •	* * *	3			6 4 4	100	3	* 1 4			1 3	4	* * *	* * *	.20
Meliaceæ		* * *	1 4 4	6					6		1 4 1	914	6	7	•••		7
Ilicineæ	4 6 0	4 # 0 8 # 0	0 0 7				***				* * 0			1		* 4 4	1
Olacineæ	* * *	h = 0	9 0 0	1	2	2	100		5	400	***		5				0
Celastrineæ	***	* 4 4	ă e s	• • •	1	7	* * *	,	1			• • •	1	3	•••	• • •	3
Rhamnaceæ	h + W	* * 1	4 * *	ï	4 2	1 8	* * *		5	• • •	* * *	* * *	5 11	3	5		11
Ampelideæ Sapindaceæ	+ a +	* * *	999	6					6		1	1	7	6 8	1		9
Anacardiaceæ	4 7 0	* # *	8 4 4	6			* * *		6			111	6	7			7
Chailletiaceæ	4 4 1	2 + 0	9 4 4						* * *			100		1	***		1
Connaraces	* * *	4 8 6	***	2		2	• • • •		4	5.4.9		• • •	4	12	1		12
Leguminosæ Rosaceæ	4 7 4	4 = 4	• • •	12	8	7	2	* * *	29	* * *	4	4	33	31	9	2	42
Combretaceæ	* * *	0 v b	111	3	1	1	* * * *	* 4 4	5		0.00	***	1 5	3		* * *	3
Melastomaceæ	4 6 7	* 6 5			4	1	0.0	1	6		1 1 4		6	27	1		28
Myrtaceæ	6 6 4	6 0 0		8	***				8		1 9 4	***	8	32	***	1	33
Rhizophoraccæ	* 9 4	* 4 4		2	2		9 6 0		4	77.0	F+ 4		4	8	* 4 4	4.9.4	8
Lythraceæ Onagrarieæ	* # 5	9 9 A		1		* * *	1 4 4	0 0. 9	2	0 Q	1	1	2	1		6 7 4	2
Haloragaceæ	* * *	1 + 1	# 4 1 1 4 4		7 0 0		* * *	7 4 4	• • •				1	2		***	1
Cucurbitaceæ	8 2 6	* * *					191	3	3		1	1	4		3	1	4
	* 1 *	* * *	***	1	1 1 4	110		* * *	1								
Datiscaceæ		* * *	4 4 9	1 3 4	***	1			1		* 7 4		1		1	1	7
Datiscaceæ Passifloraceæ	* > 1			3		***		100	3	• • •	1	1	1.	3	* * *	1	3
Datiscaceæ Passifloraceæ Crassulaceæ	• • •	* * *	1			* 4 *		***	0	* 4 4	* * *	. 4 -	1		2		2
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Datiscaceæ Passifloraceæ Crassulaceæ Araliaceæ Umbelliferæ Alangiaceæ Caprifoliaceæ Loranthaceæ	* * * * * * *	0 7 6 9 4 9 0 6 5	0 0 1 1 0 0	* * * * * *	I 4	0 0 d			4				4	5			5
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^{*} I have not changed the numbers in this recapitulation, although some additions and corrections have been made therein since the first submission. The general results are not, or almost not, affected by it, and where they are, it is corrected in the sequel.

				Indigenous plants.					RODU			SIN	GAPO	RE F	LOR≜		
NAT	ural Or	DERS.		Trees.	Shrubs.	Climbers.	Perennials.	Annuals and Biennials.	Total.	Woody.	Herbaceous.	Total	Total.	Indigenous, woody.	Indigenous, herbaceous.	Introduced plants.	Total,
Styraceæ		6.0												2	,		2
Oleaceæ	6 6 a	5 0 8	,	1					1			7 0 4	1	1			1
Jasminaceæ	0.0.9	b 4 &	6 4 9		1		1		11		1	1	12	$\begin{vmatrix} 2\\16 \end{vmatrix}$		•••	16
Apocynaceæ Asclepiadaceæ	8 4 6	† p. 8	* * *	3	4	3 7	3	***	10				10		11	1	12
Loganiaceæ	4 + 8 8 B			1	1				2				2	5	1	1	5
Bignoniaceæ		< 4 6 8 0 8	93.	4				* * *	4				4	2		-00	2
Moringaceæ	* * *				• • • •		***					""	,	1		- 4	Ì
Convolvulaceæ	1 + 4	6 0 0	• • •			5	1 1		6		1 1	1	7	2	3 2	* * *	5
Borragineæ Solanaceæ	7 4 7	\$ 6 e	* 6 4		1	• • •		1 1	3		4	4	4 5		2	2 9 4	$\begin{vmatrix} 2\\2 \end{vmatrix}$
Scrophularineæ	1 = 1	6 6 6	164					1			5	5	5	***	10	1	11
Gesneraceæ	* * *	6 0 0 0 6 a	0 0 å		1				1				1		2		2
Acanthaceæ	* * *	B 😽 u	0 4 +			1	4	5	10				10	10	7	1	8
Verbenaceæ Labiatæ	9 9 4	0.2 8	***	3	2	3	2		10	1	2 2	3 2	13 2	10	10	3 2	23
Amarantacea	* * *	* 6 6	8 4 +				. , ,	•••	* * *		5	5	5		6	1	7
Nyctaginaceæ	9 6 E	+ 6 6		2					2				2		1	-	li
Polygonaceæ	1 4 2	3 4 c					,				1	1	1		1		1
Lauraceæ		b + 0		5		1		1	6			8 0 4	6	14	1		15
Myristicaceæ Proteaceæ		* * *	,	4			* * *		4				4	12	, .		12
Thymeleaceæ	0 0 0	4 2 4	* * *		* * *	***	0 4 8	• • •						$\begin{array}{ c c }\hline 1\\ 2 \end{array}$	1 4 9		1 2
Hernandiaceæ	* * *	4 9 9	***	i			0 to 0	***	1				1	1			1
Begoniaceæ	0				744	* * * *	1 • 1	1	1				1	30.7	2		2
Papayaceæ		6.6.9	0 4 4				* * *	***		1			1	206		1	1
Mollugineæ	• • •	4.4.4	8 9 9		,		***		7		4 + p	•••	1 1	201	2	1	1
Aristolochiaceæ Euphorbiaceæ	0 + 0	E 6 9		23	18	• • •	1		1 42	***	2	2	1 44	24	4	1	29
Urticeæ	6 6 6	8 4 4	111	20			ī	9 3- 0	1	,,,			1	4	3	1	4
Celtideæ	0 0 0	0 0,0 0 A	***	3	1	0 0 0	* * * *		3				3	3			3
Moraceæ	***	6 6 F		14	1	1			16		1 - 1		16	28			28
Piperaceæ Myricaecæ		å q %	0 0 4				2		2			* * *	2	4	2		6
Juglandaceæ	1 . 1	9.1.6	3 + 4		4 6 0	* * *	114	0 6 9			\$ 0 B			1	,		1
Cupuliferæ	6 # 8	9 & 4	8 4 4		0 4 4		0 p 6	10.00				5	***	4		1 - 1	4
Casuarineæ	4 40 0	6 0° 0 ***				0 0 7	0 11 1						19+	1	4 * *		1
Podocarpeæ	+ A +	7 . 5		1		7	117		1				1	2	.,,	1 4 1	2
Gnetaceæ Cycadeæ		* 6 6	* * *	73	2 6 8	1	•••	* * *	1		• • •		1	1			1
Indeterminatæ	\$ 0 Q		0,00	1 14	15	1	i	3	34	***			34				
Palmæ	* 1 1	0 0 0	6 8 6 5 6 9	9		6	.,,	***	15				15	10			10
Pandaneæ			9 4 0	2	8 7 7	1			3				3	5			5
Aroideæ	1.6.6	* * *				3	2		5			,,.	5	,	6	,	6
Najadeæ Lemnaceæ	0 G V	9 9 5	k n h	- , .		• • •			• • •	• • •					1	* * *	1. 1.
Hydrocharideæ	0 + 0	* * h	0 9 0	- 1 4		* * *	1	111	1		, , ,		1		3	***	3
Dioscoreaceæ	0 0 0	v e d 4 s a-	170	14-	1 1 1	2			2	1 • 6	114		2		2		2
Burmanniaceæ	8 1 8	4.4.1				* 1 *	1		1		A + +		1		3		3
Orchidaceæ Zingiberaceæ		8 6 8			* * *	1	23	* * *	24 7	7 6 6			24 7	7 . 1	58 4	0 6 0	58 4
Marantaceæ	* 6 5	T 0 A					7 3	* * *	3		ï	ï	4	u + q		* * * *	2
Musaceæ	6 0 d	# # A			* * *		1		1		4 0 4		1		2 1		1
Bromeliaceæ		E + 6		1 . 1		* * *	4 0 1	* * *			411					1	1.
Amaryllideæ	* * *	e ± \$				* 1 *	2	1 0 6	2		7		2	• • •	2 1	* * *	2
Xerotideæ Liliaceæ	0 0 4	4.4.0	3 + 4	2	a 6- 6	3	3	8 + 8	8	• • •	1 4 4		8		6	4 4 4	1 6
Commelynaceæ		0 4 5			• • •	1	2	1	4	***			4		5		5
Pontederiaceæ		-0 K S		4 6 0	* * *	111	,	4 4 0	4 + 4		111				2 2		2
Eriocauloneæ	11 2 4	a + b								444					2	. 7 7	2
Xyrideæ		6 9 9				0 0 4	10		19		9	9	22	.,,	1 4		1 34
Cyperaceæ Gramineæ	* * 4	* 8 9		2	* * *	1	13 11		13 14		16	9 16	30	5	38	2	45
	6 6 4	* * *	\$ 6 9		6 6 7		J. J.	4 1 4	Z. D	0 9 0							
		TOTAL		209	116	82	92	21	520	2	74	76	596	524	312	31	862

There are thus 520 indigenous species observed, distributed among 300 genera, which gives an average $1\frac{1}{2}$ species for every genus.

The proportion of Endogens to Exogens is 1: 4, thus nearly the same as that of the Singapore plants, which is 1:3.4; in the Galopagos it is 1:6. The families which have the greatest number of species, arranged in order of number of species, are the following. I have added those of Ceylon, Hong-Kong, and Galopagos for comparison.

Andamans.	Singapore.	Ceylon.	Hong-Kong.	Galopagos.
Euphorbiaceæ. Rubiaceæ. Leguninosæ. Orchideæ. Moraceæ. Palmæ. Gramineæ. Cyperaceæ. Anonaceæ. Ampelideæ. Apocyneæ. Asclepiadeæ. Verbenaceæ. Sterculiaceæ. Acanthaceæ.	Rubiaceæ. Orchideæ. Leguminosæ. Gramineæ. Cyperaceæ. Myrtaceæ. Melastomaceæ. Euphorbiaceæ. Verbenaceæ. Anonaceæ. Apocyneæ. Tiliaceæ. Myrsineæ. Lauraceæ.	Leguminosæ. Gramineæ. Orchideæ. Rubiaceæ. Cyperaceæ. Euphorbiaceæ. Acanthaceæ. Compositæ. Melastomaceæ. Labiatæ. Convolvulaceæ. Myrtaceæ. Scrophularineæ. { Dipterocarpeæ. Asclepiadeæ.	Gramineæ. Leguminosæ. Compositæ. Cyperaceæ. Euphorbiaceæ. Rubiaceæ. Orchideæ. Scrophularineæ. Acanthaceæ. Verbenaceæ. { Moraceæ. Labiatæ. Myrsineæ. Lauraceæ. Apocyneæ.	Compositæ. Gramineæ. Leguminosæ. Euphorbiaceæ. Boragineæ. Amarantaceæ. Rubiaceæ. { Solanaceæ. { Cyperaceæ. { Verbenaceæ. } Convolvulaceæ. Malvaceæ. { Urticaceæ. } Portulacaceæ. Nyctagineæ.

The genera which are most richly represented in the Andamans are Ficus=13 sp.; Vitis=8 sp.; Sterculia, Pavetta, Cordyline and Cyperus, each by 5 sp.; Memecylon, Ipomæa, Myristica, Calamus, Asplenium, and Pteris, each by 4 sp.

The new species (32 in number) are in proportion to the published ones, as 1: 16·2, a rather large proportion, especially if we consider the incompleteness of the material and the close vicinity to the main land.

A considerable number of plants on the Andamans are only introduced, though some of these species in the surrounding countries are, without any hesitation, enumerated in their floras as indigenous. I noted not less than 76 of these introduced species, while in Singapore the numbers are only 31. This great difference, however, is scarcely a real one, as we can be certain that most plants at the latter place are introduced only when they are known to be non-Indian forms.

The introduced herbaceous plants on the Andamans are 74 in number; thus being in proportion to the woody plants as 37:1. Of these, seven only are American; which are, therefore, surpassed in number by nine times the introduced species from the old Continent. As regards dissemination, the American species supersede the old Asiatic forms (except grasses), however, in number of individuals.

An enquiry into the causes of the different modes of immigration of the non-indigenous plants on the Andamans would show that the whole number has been introduced by the agency of man, direct and indirect—a fact which also proves how little chance there is for exotic plants to cross the sea. I am inclined also to believe that introduction by means of winds, birds, &c., is applicable only to continents and adjacent islands, but not to isolated groups of islands. The Andamans will become an instructive spot for inquiries into the change of a flora by introductions. As I directed my full attention to herbaceous plants, I hope that I have noted nearly all the plants growing at my visit in the cleared lands.

The study of the tree vegetation I consider the most important part of a flora. Dr. F. Mueller, in Melbourne, in drawing up a list of the Australian forest trees, has pointed out the dissimilarity of the New Holland and New Zealand tree vegetation. Future inquiries into the tree vegetation of the Indian flora (but also of all other floras) will cause a considerable rectification of earlier statements, and will show the wrong deductions we arrived at in ascribing too much importance to herbaceous plants. A glance at the numerous lists, exhibiting the more striking resemblances between remote floras,

shows us that the greatest part of these resemblances occurs among herbaceous species. The study of so-called cosmopolitan plants, however, appears to me not less important. If it is true that those plants which have the widest range over our globe are at the same time those which have survived the greatest number of geological changes, then I am inclined to consider water plants as the most ancient. The similarity, nay identity, of a great proportion of aquatic plants in the most remote and climatogically different countries now unconnected with each other, makes such an assumption not improbable. The aquatic types, which are more or less developed in so many families, deserve particular notice in our inquiries into the laws of distribution of plants.

Returning now from the scientific classification and distribution to compare the general growth of the plants and their habit, we obtain the following

result:-

		Dic	OTYLEDONS.	Monocotyledons.			
Description.	,	Species.	Proportion to the whole flora.	Number.	Proportion to the whole flora.		
Trees, large and small	4 4 0	194	1:26	15	1:48		
Shrubs	0 0 4	116	1:44	***	9 * 9 4 * 0		
Climbers	• • •	64	1:81	18	1:29		
Perennial plants		92	1:56	69	1:75		
Annuals and Biennials	•••	21	1:247	1	1:520		

The proportion of woody plants to herbaceous ones is, therefore, for the Dicotyledons 3.5: 1; for the Monocotyledons 1:11.4; and for the whole flora, 3.9: 1 (by including, however, the naturalized plants, it is much altered, namely, nearly 2.3:1).

The following is a comparative table of the proportion of the woody plants in several insular floras to the herbaceous:—

The Andamanese flora, arranged according to the habitats of the different species, will show the following rough results:—

Marine plants	• • •	• • •	* * *	1
Mangrove and salt marshes		• • •	# * 6	29
Sandy beaches	0 6 6	6 9 9		53
Forests		• • •		418
Woodless spots and cultivated lan	nds (indige	enous)	0 0 7	19

It would be interesting also to compare the floras of the eastern and western coasts with the corresponding ones of the neighbouring continent and islets. But this I am unable to perform from want of sufficient data. A similar peculiarity as on the Galopagos Archipelago, viz., the restriction of peculiar forms to the different islands, appears to me, will probably exist, as I met with several facts bearing on this subject as a species of Corypha on Termoklee Island, a Phænix on Cinque Islands, Tacca pinnatifida on Crab Island, Pogonatherum saccharoideum on Barren Island, &c.

28. It is a difficult matter to say anything about the proportion of the Cryptogams to the cryptogamæ to the phanerogamæ from the the Phanerogams.

material collected in so short an exploration.

In consequence of the different views of cryptogamists with regard to species, such comparisons are rendered very difficult even in well explored floras. It appears to me, however, more than probable that in the Andamans the number of the cryptogamæ supersedes that of the phanerogamæ in species.

When allowing 200 sp. (a number most certainly taken too low) for the fungi observed, the probable number of cryptogamæ now observed in these islands is about 345 species, which would stand in relation to phanerogamæ in the ratio of 1: 1.5.

The following is a table showing the number of species roughly arranged and distinguished, and compared with those in the Galopagos:—

		~			Anda	MANS.	GALOPAGOS.			
-		CLASSES, &c.			Number of species.	Approximate proportion.	Number of species.	Approximate proportion.		
Fungi	0 8 4	9 b a	9 6 9		200 (?)	2 (?)	1 (?)	² , (5)		
Lichenes	3 6 6	0 0 0	8 9 8	0 0 0	40		9	16		
Marine Algæ	* * *	6 • a			34	क्षेत्र क्षेत्र क्षेत्र क्षेत्र क्षेत्र	þ	160 250 100 120		
Filices		4 4 8		6 2 4	30	25	30	3.5		
Hepaticæ	0 + τ	8.4.1	9 + 42	2 4 4	20	1 5	6	<u>1</u>		
Musci		9 6 B			17 (?)	1 6	4	T 2		
Fresh water	Algæ	b • 0	4 5 4		3) č č				
Lycopodiaceæ		\$ ¢ ø			1	1 0 0				
Salviniaceæ	0 0 0	9 0 0	4 4 0	• • •	0 0 0	6 + 6	1	\$		
			Total	6 0 6	345	0 + 9	51	+ D 4		

Equisetaceæ, Characeæ, Hydropterides, and Ricciaceæ are unrepresented on the islands visited by me in accordance with the absence of ponds and swamps of fresh water.

29. While I was in the Andamans, I was in the habit of consulting people (convicts) from the most different parts of India for the native names of the plants. As a general result, I may state that the Burmans were best acquainted with the flora of the Andamans, but they are by no means equal to the Andamanese in accuracy and certainty of determination. While the Burmans were obliged continually to cut into the bark to recognise the trees, the Andamanese readily gave their names, and I could rely upon their statements, which was not the case at all with those of the Burmese.

The Andamanese names are far simpler and more euphonious than the Burmese ones.

With reference to the origin of the Andamanese aborigines, I suppose that the fact of their having a peculiar name for almost every plant is of great importance.

They commonly add the syllable "dah" to their names for trees and plants, which may signify perhaps "it is", or may be a corruption of the affirmative "uh" (yes).

They have often a single name for a diversity of plants belonging to the same family. Thus, for instance, they call *Pterocarpus dalbergioides*, *Albizzia Lebbek*, and *Inga*, altogether "beymadah." *Filices* they designate by the name "bad mar," &c.

30. The Burmans, however, go a little farther, and have one name for a variety of plants very different from each other; as for instance, Kanazo, which is applied to Heritiera littoralis and Baccaurea sapida; theet-ka-do = Sterculia ornata and Cedrela Toona; mengu = Garcinia Mangostana and Elæagnus conferta, &c., &c.

Therefore, reference cannot be made with confidence to Burmese names I have given; moreover the Burmese convicts, the only men I had to consult, appeared to me very unwilling and ignorant. I have, however, tried to correct the names as much as possible according to Dr. Mason's List of Burmese plants.

31. It would be of great interest to compare the flora of the Andamans some zoological remarks as far as with its fauna; but we are at present nearly as ignorant about its fauna as we were a short time ago about its flora. So far as I am able to judge, there exists great harmony in the peculiarities of both kingdoms.

The mammals are confined to Cynopterus marginatus, Paradoxurus Andamanicus, Mus Andamanensis and Sus Andamanensis. A wild species of cat is said by Colonel Tytler to occur, but it has never been found.

Birds appear to be numerous, but are little known. Amongst the fifteen or twenty kinds of reptiles hitherto found on these islands, two species of toads are common during the rainy season,—one of these is introduced, the other really indigenous. Their occurrence is easily explained, as they can live a long time without water.

Marine fishes are plentiful, but fresh water fishes seemed to me not to exist. Amongst mollusca, no fresh water shells or any Limacida occur, and also the few land shells are frequent only during the rains. In this period Helicina Andamanica and Cyclophorus foliaceus are exceedingly common on wet stems and on leaves.

Amongst insects the absence or scarcity of beetles, living in excrement, of *Hydrocanthara*, and other water beetles, is remarkable. Also the rapacious *Carabici* and *Staphylinidae* appeared to me exceedingly scarce.

I also saw no crabs peculiar to fresh water. A more careful examination of the fauna would surely increase the number of similar facts relating to the absence of water-loving animals.

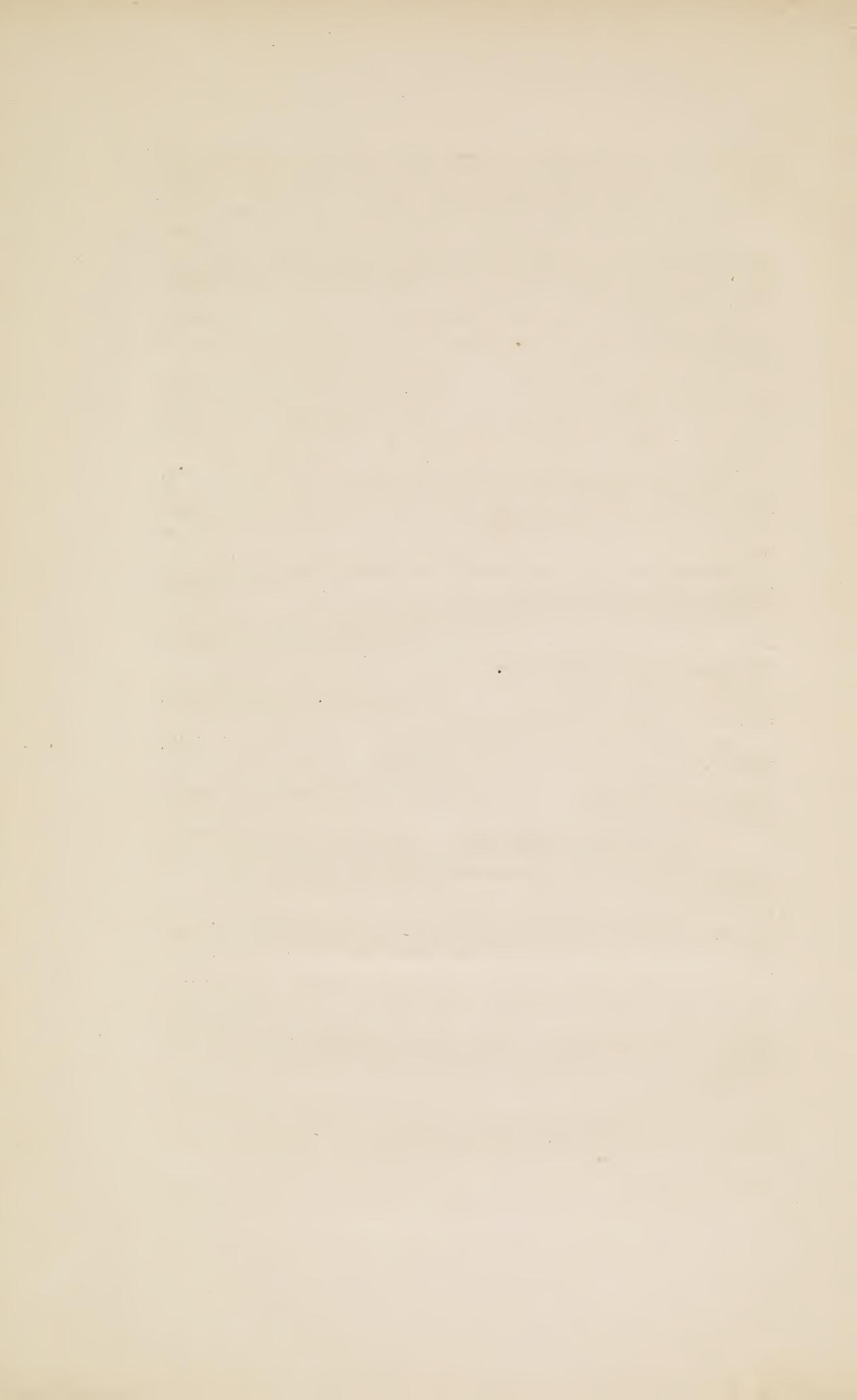
32. I cannot conclude without directing full attention to the great Importance of exploring the Anda. importance of exploring the Andaman Islands scientifically. scientifically.

These islands are the only masses of land at present known in India, which, owing to the low scale of their inhabitants and their living isolated from all communication with the surrounding countries, have never been influenced by the agency of men, and, therefore, the type of its natural productions is still a most peculiar one.

We do not possess information about a really unmixed or original flora or fauna of any part of British India, the fauna and flora of every district being mixed by foreign immigrations and importations, owing to the frequent communication which the inhabitants have possessed for many ages with various other countries.

The knowledge of the flora of the Andamans is, therefore, as important as has been shown to be that of the Galopagos Archipelago, St. Helena, and other isolated islands.

By the present rapid extension of the Penal Settlements around Port Blair and Port Mouat, the real type of the vegetation of these islands will be lost in the course of a few years, or made unintelligible by the many importations of weeds and other plants (and even of animals) which even now are rapidly spreading over the land by means of cultivation, birds, winds, &c.



APPENDIX A.

ENUMERATION OF THE PLANTS ON THE ANDAMAN ISLANDS.*

A.—DICOTYLEDONES.

DILLENIACEÆ.

- Delima sarmentosa, Linn.—A common climber throughout South and Middle Andaman, the Labyrinth Islands and Rutland.
- Dillenia pilosa, Roxb.—A large tree, which occurs especially along the Middle Straits, Labyrinth Islands and around Port Blair. Zimbjoon, Birm.; agmadah, And.—In my specimens the flowering branches are all reduced to a wart, and not elongated as in Dr. Wallich's figure of his Dillenia aurea.
- sp. nov.?— Middle Andaman, Black Creek and elsewhere, rather common. Lingyaw, Birm.

MAGNOLIACEÆ.

*Michelia champaca, Linn.—Cultivated in gardens at Port Blair.

ANONACE Æ.

- Uvaria macrophylla? Roxb.—Common in the jungles north of Watering Cove, at Macpherson's Straits and elsewhere. Only sterile shrubs observed.
- ----micrantha, H. f. et T.—In the level forests north of Watering Cove.
- Sumatrana Kurz. (Anaxagorea Sumatrana Miq.)—A large climber, which is rather common along the western coasts of South Andaman, but occurs also north of Mangrove Bay.
- Polyalthia Andamanica, Kurz.—Common all over the islands, especially frequent in the jungles north of Viper Island.
- Artabotrys speciosa, Kurz.—A large climber in the jungles of the north coast of South Andaman at Middle Straits.
- *Cananga odorata, H. f. et T.—Cultivated only in the gardens. Tha-bwot, Birm.
- Unona Dasymaschala, Bl.—Common throughout the jungles of these islands.
- Pyramidanthe macrantha, Kurz.—A little tree about 30 feet high, in the jungles at the Circular Bay north of Port Mouat, rare.
- Anaxagorea Zeylanica, H. f. et T.—A shrub common throughout the islands. Very near to Rhopalocarpus fruticosus, T. et B., differing only by the much smaller flowers.
- Oxymitra fornicata, H. f. et T.—Very common throughout all these islands. Ta-nat-sa, Birm.
- *Anona squamosa, Linn.—Cultivated only in gardens. Au-za, Birm.
- Melodorum sp.?—A little tree in the jungles at Macpherson's Straits (specimens lost.)
- Orophea polycarpa, A. DC. [Melodorum (Kentia) monospermum, Kurz.]—In the jungles north of Watering Cove at Port Blair.

^{*} Appendix C., containing the descriptions of the apparently new species, is also here omitted. These descriptions, and also other corrections and additions, will be given in my contributions towards the knowledge of the Burmese flora.

MENISPERMACEÆ.

- Tinospora cordifolia, Miers. Andamans, Dr. Playfair!—Common in the jungles throughout the islands, especially along the western coasts around Port Mouat.
- Pachygone ovata, Miers?—In the jungles of South Andaman, not uncommon. Sterile plants only seen. The petioles and the nerves on the underside of leaves are hairy. Perhaps a new species?
- Stephania rotunda, Lour.—Common throughout the jungles, especially on Tolly Peninsula of Middle Andaman.

 Some two or three other species of Menispermaceæ occur here, but they are undeterminable.

CRUCIFERÆ.

- *Brassica oleracea, Linn.—Many varieties of this plant are cultivated, but do not grow well owing to the great moisture of the atmosphere. Thaem-bau-mung-la, Birm.
- *---rapa, Linn.—As the former. Mung-la-oo-waing, Birm.
- *Raphanus sativus, Linn.—Cultivated only. Mung-la, Birm.

CAPPARIDEÆ.

- Polanisia viscosa, DC.—Cultivated lands, Ross Island, introduced and rare.
- Capparis sp.—A large climber, occurring everywhere, but not frequent. On Termoklee Island it is found in greater quantity than elsewhere.
- sepiaria, Linn.—The most common species, especially plentiful along the eastern coasts of South and Middle Andaman.
- -----ambigua, Kurz.—South Andaman, no locality. (Port Mouat?)

VIOLARIEÆ.

- Alsodeia Bengalensis, Wall.—Common all over the islands, and forming the principal part of the shrubby vegetation.
- Roxburghii, Wall.—Along the coasts between Bird-nest Cape and Corbyn's Cove, at the new salt-works at South Point and elsewhere, not unfrequent.

BIXINEÆ.

- *Bixa Orellana, Linn.—Cultivated only. Thee-den, Birm.; Arnotto, Engl.
- Flacourtia rotundifolia, Clos.—Termoklee Island common, also along the western coasts north of Port Mouat.

POLYGALACEÆ.

Xanthophyllum glaucum, Wall.—A frequent tree in the jungles throughout South Andaman. Dadeblah, And.

CARYOPHYLLACEÆ.

*Saponaria Vaccaria, Linn.—Cultivated lands near Aberdeen, introduced and rare.

PORTULACACEÆ.

- *Portulaca oleracea, Linn.—Cleared lands around Aberdeen, Haddo, on Ross Island, etc., introduced. Mya-bymeet, Birm.
- *——quadrifida, Linn.—Cleared lands around Port Blair, introduced.

SESUVIACEÆ.

Sesuvium portulacastrum, Rottl. var. luxurians.—At the sandy beach near Purslane Creek.

HYPERICINEÆ.

- Cratoxylon sp. (shrub).—Macpherson's Straits and along the eastern coasts of South Andaman.
- Tridesmis formosa, Jack.—On Flower Island in Middle Straits, and observed at some other places.

GUTTIFERÆ.

- Garcinia speciosa, Wall.—Common at Escape Bay in the interior; also around Aberdeen. Palawah or proah, Birm.
- ----Kydiana, Roxb. Andaman Islands, Col. Kyd.
- purpurea, Roxb.—In the jungles around Macpherson's Straits and Port Blair. Toung-ta-lai, Birm.
- Xanthochymus pictorius, Roxb.—Common around Port Blair, more especially, however, along the western coasts, as for instance at Port Mouat, etc. Toung-tha-lay, Birm.
- Calophyllum inophyllum, *Linn*.—Not very common, on the beaches along South and Middle Andaman and the adjacent islands. Phungnyet, *Birm*.
- spectabile, Willd.—Common in the forests of the interior and coasts of South and Middle Andaman. Pantagah, Birm.
- Mesua ferrea, Linn.—A common tree in the forests around Aberdeen, Mount Harriet, and some other places in the vicinity. Kengan or ganggo, Birm.

TERNSTRŒMIACEÆ.

Ternstræmia Penangiana, Chois.—Common in the jungles of the western parts of South Andaman, as for instance around Port Mouat.

DIPTEROCARPEÆ.

- Dipterocarpus lævis, Buch.—A common tree, forming the prevalent type of the Andamanese forests and nearly nowhere absent. Kanyeen-nee, Birm.; arreindah, And.
- alatus, Roxb.—With the former, but not so common, occurring principally around Aberdeen, Phœnix Bay, etc. Kanyeen-phu, Birm.
- Ancistrocladus extensus, Wall.—A common climber throughout the islands.

 The Andamanese make their arrows from its wood.
- Shorea sp.—The leaves only seen. In the jungles around Aberdeen and Mount Harriet.
- Hopea odorata, Wall.—In the forests of the eastern parts of South Andaman, very rare. Thengan, Birm.
- ----sp.—Rather frequent in the jungles around Port Blair.

MALVACEÆ.

- *Sida acuta, Burm.—Cleared lands, Aberdeen, Ross Island, etc., introduced.
- Urena lobata, Linn.—In the bamboo jungles of Middle Andaman, common; also on Ross Island.
- Hibiscus tiliaceus, Linn.—A most common shrub or little tree along the eastern coasts of South and Middle Andaman, becomes rather rare along the western side. Lyee-nga-sha, Birm.
- *---rosa sinensis, Linn.—Cultivated only.
- Thespesia populnea, Corr.—With Hibiscus tiliaceus the most characteristic feature of the shore vegetation throughout the islands. Bokemay-za, Birm.
- *Gossypium herbaceum, Linn.—Cultivated only. Wa, Birm.
- Bombax malabaricum, DC.—Common all over the islands, especially frequent along the shores. Diedoo or let-pan, Birm.; gerengdah, And.
- Eriodendron anfractuosum, DC.—In the forests at Macpherson's Straits. Letpan, Birm.

STERCULIACEÆ.

- Sterculia ornata, Wall.—Common in the leafless jungles around South Corbyn's Cove and elsewhere. Shau-nee, Birm.
- parviflora, Roxb?—Rather common in the kuppalee forests at Macpherson's Straits and elsewhere.
- ——alata, Roxb.—Coasts along North Bay, Macpherson's Straits, and all around Port Blair.
- foetida, Linn.—In the jungles around Port Blair, especially at South Point. Letkhok, Birm.
- ----colorata, Roxb.—Very common all along the beaches and shores of the eastern coasts of South and Middle Andaman. Berdah, And.
- Heritiera littoralis, *Dryand*.—A most common tree along the beaches throughout the islands. Pinlay-kanazoe, *Birm*.
- minor, Lamb.—With the former.
- Pterospermum aceroides, Wall.—Dispersed throughout the jungles, especially along the western coasts. Tha-ma-jam-wai-zoke, Birm.
- Buettneria aspera, Colebr.—Rather common in the jungles of South Andaman, especially in the interior.
- Andamanensis, Kurz.—Rather a common climber throughout the islands, especially around Port Blair.

TILIACEÆ.

- Grewia calophylla, Kurz.—In the jungles around South Point and elsewhere, rather rare. Mayan-boe, Birm.
- ——microcos, Linn.—In the jungles around Mount Harriet, very scarce. Mya-ya, Birm.
- Leptonychia heteroclita, Kurz.—Only a sterile shrub seen at the Circular Bay of Port Mouat.
- Elaeocarpus robustus, Roxb. (E. Helferi, Kurz.=No. 696 Hb. Helf.)—A small tree, common all along the western coasts of South Andaman; rare, however, around Port Blair. Tau-man-gyee, Birm.

MALPIGHIACEÆ.

- Hiptage Madablota, Gaertn.—In the jungles around South Corbyn's Cove, only the fruits seen.
- Aspidopterys tomentosa, A. Juss.—In the jungles north of Watering Cove.

OXALIDEÆ.

*Oxalis corniculata, Linn.—Cultivated lands around Port Blair, introduced and rare.

BALSAMINEÆ.

*Impatiens Balsamina, Linn.—Cultivated in gardens, and sometimes spontaneously. Pansheet, Birm.

RUTACEÆ.

- Toddalia sp.?—A high climber on Termoklee Island and elsewhere on the western coast north of Port Mouat. Ka-fheet-hsoo, Birm.
- Acronychia pedunculata, Miq.—Common along the ridges at South Point; also seen north of Viper Island.
- Glycosmis arborea, DC.—A small tree, observed abundantly in the coast jungles at Muddy Creek.
- ——pentaphylla, Corr.—A most common shrub, forming the principal part of the shrub vegetation in many places.
- Murraya exotica, Linn.—A little tree, throughout South and Middle Andaman, but not copious, except on Termoklee Island. Tha-nat-kha, Birm.

- Atalantia citrifolia, Kurz. (Paramignya micrantha, Kurz).—A large climber, on the eastern side of Mount Harriet and elsewhere.
- ——monophylla, Corr. var. B. macrophylla, Oliv.—Common along the coasts from Macpherson's Straits to South Corbyn's Cove.
- *Citrus decumana, limetta et Medica occur cultivated in the gardens of Europeans.
- Ægle marmelos, Corr.—I am told by the Burmans occurs in the jungles.

SIMARUBACEÆ.

- Picrasma Javanica, Bl. (P. Andamanica, Kurz.)—In the jungles around the south-west base of Mount Harriet, rather common.
- Harrisonia (Brownei?).—A shrub on Bird-nest Cape, rare, nowhere else observed. (Specimens lost).

OCHNACEÆ.

Ochna Andamanica, Kurz.—A little tree common all over South and Middle Andaman and adjacent archipelago. Hsen-way, Birm.

BURSERACEÆ.

- Garuga pinnata, Roxb.—In the jungles around Port Mouat, rather frequent, rare around Port Blair. Kyoung-yook, Birm.
- Canarium euphyllum, *Kurz.*—A most common tree along the western coasts around Port Mouat; also in the deciduous forests around South Corbyn's Cove and elsewhere. Kywae, *Birm*.
- Port Blair, as at Aberdeen, Phœnix Bay, etc., and in the interior west of Black Creek. Dadeblah, And.; moontjay, Birm.

MELIACEÆ.

- Chickrassia tabularis, A. Juss.—In the forests around Port Blair, and especially along the western coast north of Port Mouat, rather common I have seen no flowers nor fruits. Theekadooh, Birm.; arrodah, And.
- Chisogeton grandiflorum (Diplotaxis grandiflora, Wall).—A high forest tree, dispersed throughout the jungles of South Andaman.
- Milnea sp.—A tree about 30 to 40 feet high, in the jungles between Port Mouat and Homfray's Ghât, not rare. Tau-ahnyeen, Birm.
- Walsura hypoleuca, Kurz.—In the jungles, especially in the interior, a most common tree. Nwah-le-byin, Birm.
- ----villosa, W. A.—Along with the former, and equally frequent.
- Carapa obovata, Bl.—Common in the mangrove swamps all along the coast of Port Blair and along the western coasts. Penlay-oong, Birm.; ooldah, And.
- ———moluccensis, A. Juss.—Along the western coasts around Port Mouat, common. Penlay-oong, Birm.

OLACINEÆ.

- Ximenia Americana, Linn.—Along the shores at Escape Bay. Pen-lay-hsee, Birm.
- Cansjera Rheedii, Gmel.—A common climber throughout the islands and adjacent Labyrinth Archipelago.
- Anacalosa puberula, Kurz.—Eastern coasts of South Andaman, rather frequent.
- Apodytes Andamanica, Kurz.—Rather frequent in the jungles of South Andaman at Macpherson's Straits, Mount Harriet, Homfray's Ghât, Port Mouat, etc.
- Sarcostigma edule, Kurz. (Chailletia edulis, Kurz).—Rather common throughout the islands and Labyrinth Archipelago.

CELASTRINEÆ.

Salacia prinoides, DC.—At Escape Bay along the beaches, at the eastern base of Mount Harriet, and elsewhere.

RHAMNACEÆ.

- Ventilago calyculata, Tulasn.—In the jungles around South Corbyn's Cove.
- Zizyphus Jujuba, Linn.—In the jungles around Aberdeen and elsewhere.
- glabra, Roxb.—Jungles around Aberdeen.
- ———Œnoplia, Mill.—Common in the jungles between Port Mouat and Homfray's Ghât, and elsewhere.
- Colubrina Asiatica, Brongn.—A common thorny shrub behind the mangrove zone, and occurring throughout the islands.

AMPELIDEÆ.

- Vitis Indica, L.—In the jungles around Port Blair, rather scarce.
- ——pentagona, Voigt. (Cissus pentagona, Roxb. Fl. Ind.)—Common behind the mangrove swamps on Termoklee Island.
- discolor, Miq.—Common in the jungles on Termoklee Island.
- glauca, Wall. (=No. 1307 Hb. Helf.)—Common all over South and Middle Andaman, and adjacent islands.
- —repanda, W. A. (V. laeta, Wall.)—Western parts of South Andaman and Labyrinth Archipelago.
- tenuifolia, W. A.—Between Port Mouat and Homfray's Ghât common, also elsewhere around Port Blair.
- ——pedata, Roxb.—Seashores near Corbyn's Cove and some other localities, rather common.
- ——muricata, Heyne.—A common species through the whole of the islands and a principal constituent of the climber vegetation. Yenhnoung, Birm.
- Leea acuminata, Wall.—Common in the interior of the jungles north of Mangrove Bay.
- ——sambucina, Willd.—Common all over South and Middle Andaman and adjacent islands; attaining here a height sometimes of 20 and 25 feet. Kalet, Birm.
- ——hirta, Banks.—Common between Port Mouat and Homfray's Ghât; also in the jungles north of Mangrove Bay frequent.

SAPINDACEÆ.

- *Cardiospermum halicacabum, Linn—Cleared lands around Aberdeen, common but introduced. Mala-mai, Birm.
- Schmidelia glabra, Roxb.—Rather common in the jungles at Macpherson's Straits, along the whole western coasts, and in the Labyrinth Islands.
- Erioglossum edule, Bl.—Dispersed throughout the jungles around Port Blair. Hseik-khyæ, Birm.
- Cupania Lessertiana, Camb.—In the jungles of Port Mouat, not rare.
- Sometia tomentosa (Trina tomentosa, Bl.)—Common, especially in the interior of South Andaman, but also all along the eastern coasts and on Termoklee Island. Tha-byae Birm.; badoh, And.
- ——glabra? Bl.—A most common tree throughout the islands, especially along the eastern coasts. Hpagha-nja-zoo, Birm.
- Harpullia cupanioides, Roxb.—A most common tree from Homfray's Ghât to Port Mouat, but also along the western coasts.

ANACARDIACEÆ.

- Mangifera sylvatica, Roxb.—Common throughout the islands, especially at Escape Bay. Thayet, Birm.
- *-----Cultivated.
- Odina wodier, Roxb.—A common tree throughout the forests of South and Middle Andaman. Hnan-bai, Birm.
- Parishia insignis, H. f.—Dispersed throughout the jungles around Port Blair and elsewhere, but nowhere copious. Theetsae, Birm.

 In my specimens the sepals are purple, downy, and varying from three to four in number.
- Bouea oppositifolia, Lamb.—Common throughout the jungles, principally on Mount Harriet.
- Spondias Mangifera, Willd. (fructibus luteis, acidis).—With the former, and more frequent, especially around Aberdeen, Black Creek, etc. Kywae, Birm.
- Dracontomelum sylvestre, Bl.—A most common forest tree throughout South Andaman. Ramanee, Birm.; gunradah, And.

CONNARACEÆ.

- Rourea commutata, *Planch*.—Rather common throughout the islands, especially along the western coasts.
- Cnestis ignea, Planch.—A tree rather common throughout the jungles along the eastern coasts around Port Blair.
- Ellipanthus calophyllus, Kurz.—In the jungles north of Watering Cove.

MORINGACEÆ.

*Moringa pterygosperma, Gaertn.—A couple of trees observed on Viper Island evidently planted. Da-tha-lwon, Birm.

LEGUMINOSÆ.

- *Lupinus sp.—Cultivated in gardens.
- *Agati grandiflora, Desv.—Cultivated at Hope Town, Ross Island, etc. Poukban, Birm.
- *Cicer arietinum, Grah.—Cultivated only.
- *Pisum sativum, Linn.—Cultivated only.
- Dendrolobium umbellatum, Wight et Arn.—A shrub on the beaches north of Port Mouat plentiful, also at South Point. Djoolaeedah, And.
- *Desmodium triflorum, DC.—Common in cleared lands around Port Blair, introduced.
- Pteroloma triquetrum, Dl.—Common in a bamboo jungle north of Watering Cove and Mangrove Bay. Andamans: Dr. Playfair! Mokehso-hlan-ma, Birm.
- *Clitoria ternatea, Linn.—Cultivated and sometimes as wild. Oung-mai-phyoo, Birm.
- Mucuna gigantea, DC.—A common climber all along the coasts from Macpherson's Straits to Middle Andaman, also on Crab Island, Termoklee, etc. Guludeembdah, And.; Kwæ-lae, Birm.
- Erythrina Indica, Lam.—Common along the beaches throughout the islands, on the eastern coasts more plentiful. Ka-theet, Birm.
- Dioclea sp.--Along the seashores of the eastern coasts, not unfrequent.
- Canavalia gladiata, DC.—Cultivated only. Pai-noung-nee, Birm.

- *Phaseolus, several species.—Cultivated only in gardens.
- ——rostratus, Wall.—Common along the shores, especially at south Corbyn's Cove, Homfray's Ghât, western coasts north of Port Mouat, etc.
- *Vigna sinensis, Savi.—Much cultivated by native convicts.
- *Lablab vulgaris Savi.—Cultivated only. Pai, Birm.
- *Pachyrrhizus angulatus. Rich.—Cultivated. Pai-myeet, Birm.
- *Cajanus Indicus, Spreng.—Cultivated and sometimes wild. Pai-yen-khyang, Birm.
- Abrus precatorius, Linn.—Common in the jungles of the coasts throughout the islands. Rwaegnay or kyen-rwae, Birm.
- Pterocarpus dalbergioides, Roxb.—A common tree throughout the islands, especially along the western coasts and on the Labyrinth Archipelago, Rutland, etc. Pa-douk, Birm.; Djalangadah, And.
- Brachypterum scandens, Bth.—A common climber throughout the islands, especially along the coasts.
- Derris uliginosa, Bth.—Shores behind the mangrove swamps at Hope Town from Aberdeen to South Point, etc.
- -----sp. (panicula ferrugineo-tomentosa.)—Along the shores at South Point.
- Pongamia glabra, Vent.—A common tree along the beaches throughout the islands. Tha-ween, Birm.
- Dalbergia tamarindifolia, Roxb.—In the bamboo jungles of the south coasts of Middle Andaman and elsewhere.
- emarginata, Roxb.—Rather common along the beaches of the eastern coasts of these islands, especially at South Corbyn's Cove.
- Sophora tomentosa, Linn.—Beaches north of Port Mouat, also between Aberdeen and South Point.
- Guilandina Bondhuc, Linn.—A common climber along the shores throughout the islands. Ka-leing, Birm.
- *Poinciana pulcherrima, Linn.—Only cultivated. Doung-souk, Birm.
- Caesalpinia nuga, Ait.—Common along the coasts of South and Middle Andaman. Hsoo-kouk, Birm.; dulangugadah, And.
- Peltophorum ferrugineum, Vog.—Rather common along the shores between South Corbyn's Cove and Port Blair, frequent.
- *Cassia alata, Linn.—Hope Town, as wild, but evidently introduced. Mai-za-lee-gyee, Birm.
- *——fistula, Linn.—Cultivated in gardens at Ross Island. Gnu-gyee, Birm. Outea bijuga, DC.—A shrub along the shores at Middle Straits.
- Intsia palembanica? Miq.—A large tree in the forests along Port Blair, also plentiful along the western coasts. Pynkado, Birm.; dhsagundah, And.
- Bauhinia sp.—In the jungles around Aberdeen. Palan, Birm.
- Cynometra bijuga, Spanoghe.—Common all along the beaches and near the mangrove swamps, especially along the eastern parts.
- Entada Pursaetha, DC.—A most common climber, covering the trees, especially along the western coasts, totally. Kung-nyen, Birm.
- Adenanthera pavonima, Linn.—In the jungles of the interior and along the coast zone, especially along the western coasts, on Termoklee Island, etc. Rwae-gyee, Birm.
- *Mimosa pudica, Linn.—Cleared lands around Aberdeen and Phœnix Bay, rare, introduced. Hte-ka-yung, Birm.
- Acacia intsia, Willd.—A large climber along the southern shores of Middle Andaman, western coasts of South Andaman, and elsewhere.

- Acacia pennata, Willd.—In the jungles around Port Mouat and south coast of Middle Andaman.
- caesia? W. A.—A common tree around Mount Harriet and southern coast of Middle Andaman. Ken-bwon, Birm.
- *Acacia glauca et farnesiana, Willd.—Are much cultivated on Ross Island.
- Albizzia Lebbek, Bth.—Common in the jungles throughout the islands, especially at South Corbyn's Cove and other parts of the eastern coasts. Kukko, Birm.; beymadah, And.
- Julibrissin, Boiv.—In the bamboo jungles along Middle Straits.

ROSACEÆ.

- *Rosa.—Several species are found cultivated in gardens.
- Prunus martabanica (Cerasus martabanica, Wall.)—Frequent in the evergreen forests of South Andaman. Pannoo, Birm.

COMBRETACEÆ.

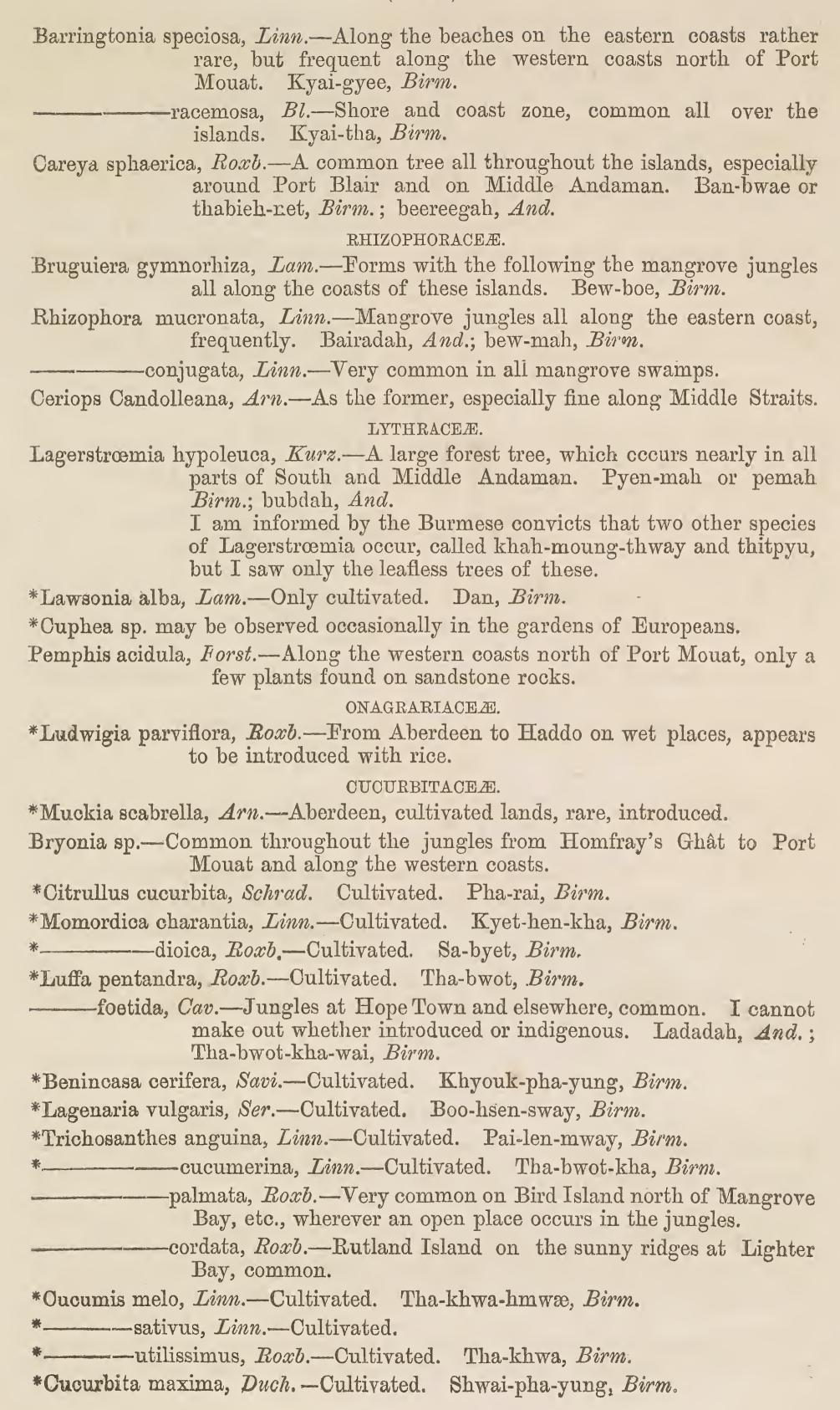
- Terminalia procera, Roxb., (scarcely different from T. Catappa).—Common throughout the jungles of South and Middle Andaman, etc. Bankha, Birm.; bailadah, And.
- bialata, Wall.—Rather common throughout South Andaman, especially along the eastern coasts. Touk-kyan, Birm.
- Poivrea Roxburghii? DC.—A climber in the leafless jungles around South Corbyn's Cove. Tha-ma-ka, Birm.
- Gyrocarpus Asiaticus, Willd.—Rather frequent along the eastern coast of South Andaman.
- Lumnitzera racemosa, Willd.—Along the southern coast of Middle Andaman, at Middle Straits, frequent.
- *Quisqualis Indica, Linn.—In gardens of Europeans, cultivated.

MELASTOMACEÆ.

- Melastoma sp.?—Along the ridges from South Corbyn's Cove to Phœnix Bay and elsewhere, in moist places, rare. Araglaka goreimdeendah, And.
- Sonerila sp.??—Moist and rocky places in the jungles at Watering Cove.
- Memecylon, sp. No. 2.—In the jungles north of Watering Cove.
- tinctorium, Kænig.—Rather frequent throughout the jungles of these islands.
- sp. No. 1. (near M. cœruleum, Jack.)—Not uncommon throughout the jungles, especially along Middle Straits.
- pauciflorum? Bl.—Common all over the jungles, especially from Macpherson's Straits, along the western coasts, and the Labyrinth Archipelago.

MYRTACEÆ.

- Sonneratia alba, Sm.—All along the mangrove swamps, but not copious.
- acida, Linn. fil.—Much scarcer than the former, and occurring only along the eastern coasts. Taba or ta-mah, Birm.
- *Punica granatum, Linn.—Cultivated only. Tha-lay, Birm.
- *Psidium guava, Linn.—Cultivated only. Malaka, Birm.
- Acmena zeylanica, Wight.—A little tree between Homfray's Ghât and Port Mouat.
- ———leptantha, Wight.—Beaches at Jolly Peninsula.
- Jambosa alba, Rumph.—Common all over the shore and coast zone.



DATISCACEÆ.

Tetrameles nudiflora, R. Br.—A common tree in the leaf-shedding forests along the coasts. Memboah, Birm.

PASSIFLORACEÆ.

- *Passiflora laurifolia, Linn.—Cultivated in gardens of Europeans.
- Modecca heterophylla, Bl. (an eadem ac M. trilobata, Roxb.?)—Common all over the islands, and climbing up the trees for more than 80 feet.

CACTACEÆ.

*Several species of Opuntia, Cereus, Melocactus, Epiphyllum and Echinocactus observed in the gardens of Europeans.

CRASSULACEÆ.

Bryophyllum calycinum, Salisb.—On Ross Island in cultivated lands, rare, and evidently introduced. Ywet-kya-pen-pouk, Birm.

UMBELLIFERÆ.

- *Anethum graveolens, Linn.—Cultivated. Samwat, Birm.
- *----sowa, Roxb.--Cultivated. Sa-myeik, Birm.
- *Pimpinella involucrata, Wight.—Cultivated. Sa-mung-sa-ba, Birm.
- *Cuminum cyminum, Linn.—Cultivated. Zee-Ya, Birm.
- *Coriandrum sativum, Linn.—Cultivated. Nan-nan, Birm.

ARALIACEÆ.

- Polyscias nodosa, Seem.?—Common in the forests of the western coasts around Port Mouat, and on the Labyrinth Islands. Only sterile trees seen.
- Brassaiopsis palmata, Kurz. (Araliopsis Andamanica, Kurz.; Panax palmatum, Roxb).—In the interior west of Black Creek.
- Paratropia venulosa, W. et. A.—Common all over the jungles, but nowhere in great quantity. Baloo-letwa, Birm.

ALANGIACEÆ.

Alangium sundanum, Miq.—In the forests of Aberdeen. Agnarah, And.

LORANTHACEÆ.

- Loranthus longiflorus, Desv.—Jolly Peninsula on Acmena leptantha.
- Viscum (V. heteranthum, Wall?).—Mount Harriet, between Aberdeen and South Point, etc., on Artocarpus chaplasha. Godambdah, And.

RUBIACEÆ.

- Nauclea sp.—A high forest-tree in the deciduous jungles around South Corbyn's Cove and elsewhere. Hteing, Birm.
- Uncaria pilosa? Bth.—Common around Port Blair in the jungles.

the rains.

- Mussaenda macrophylla, Wall.—Common all over these islands, and recognisable during the flowering time from a great distance by the white segments of the calyx.
- Ophiorrhiza rugosa, Wall.—Ridges north of Port Mouat, and especially in the fertile soil of the jungles at Bamboo Creek.
- *Hedyotis Burmanniana, Forst.—Cultivated lands around Port Blair, introduced.

 hispida? Roxb.—In the jungles around Hope Town, very common on the
- ridges on Jolly Peninsula, between Island Bay and Port Mouat.

 ——sp.—In the jungles around Watering Cove and Mangrove Bay during

- *Pentas carnea, Bth.—Cultivated in gardens.
- *Rondeletia speciosa, Lodd.—Cultivated in gardens.
- *Dentella repens, Forst.—Cultivated lands on Ross Island, around Aberdeen, etc., introduced.
- Morinda bracteata, Roxb.—Rather common in the jungles throughout the islands. Nyau-hwae, Birm.
- lanceolata, Wall.—Rather scarce, in the jungles at Black Creek. Yaiyo, Birm.
- Hydnophytum formicarum, Jack.—Common on trees in the mangrove swamps along the whole of the coasts.
- Mephitidea rhinozerotis, Rwds.—In the jungles around Port Blair, rather frequent.
- sp.—Very frequent throughout the jungles of these islands, especially along the western coasts.
- Grumilea elongata, Wight.—A most common shrub throughout the islands. Dadedah, And.
- sp.—Very common in the interior north of Escape Bay, along the western coasts and elsewhere.
- Psychotria Asiatica, Linn.—Along the western coast, around Port Mouat especially; also at South Point.
- Geophila reniformis, Don.—In the bamboo jungles of Mangrove Bay on fertile soil.
- Scyphiphora hydrophyllacea, *Gaertn*.—Along the shores here and there common, as for instance at Middle Straits, Corbyn's Cove, Mangrove Creek, etc.
- Canthium sp. nov.? (sp. No. 1).—Rather common in the jungles between Port Mouat and Homfray's Ghât, and along the western coasts.
- Timonius, sp. No. 1.—In the jungles around South Point.
- sp. No. 2.—In the jungles at Port Mouat.
- Guettarda speciosa, Linn.—A common small tree all along the sandy beaches from Rutland to Middle Andaman and on the Labyrinth Archipelago. Domdodah, And.
- Serissa ternata, Kurz. (Paederia ternata, Wall.)—Rather common throughout the islands, principally along the western coasts.
- Coffea sp.—A little tree in the jungles between Homfray's Ghât and Port Mouat.
- Pavetta, sp. No. 5.—Rather frequent on Rutland Island, along the western coast, and on the Labyrinth Archipelago.
- sp. No. 2. (= No. 3004 Hb. Helf.)—Rather common along the coasts throughout the islands; a tree 25 to 30 feet high.
- ——coriacea, R. Br.—Rather frequent with the former.
- ——weberaefolia, Wall.—In the jungles around Port Blair, especially at Mangrove Bay and Watering Cove.
- sp. No. 3. (= No. 2993 Hb. Helf.)—Common throughout the jungles of these islands.
- Stylocoryne densifiora, Wall.—Along the western coasts principally; also, but less frequent, at Macpherson's Straits.
- webera, A. Rich.—Throughout the jungles of South and Middle Andaman.
- Griffithia sp. (= No. 2807 Hb. Helf.)—Common throughout South and Middle Andaman and adjacent Labyrinth Archipelago.

- Gardenia turgida, Roxb.—Dispersed in the jungles, especially between Aberdeen and Haddo.
- pulcherrima, Kurz.—A small tree dispersed throughout the jungles of South Andaman, but nowhere in great quantity.
- Rubiacea.—In the jungles around Aberdeen, a tree about 30 feet high.

COMPOSITÆ.

- *Vernonia cinerea, Less.—Common all over the cleared lands, but only introduced.
- *Elephantopus scaber, Linn.—Ross Island in cultivated lands, rare, introduced.
- *Ageratum conyzoides, DC.—Common on cleared ground, rapidly penetrating into the jungles whenever a little cleared, introduced.
- Blumea virens, DC., (Conyza angustifolia, Roxb. Fl. Ind. III., 429).—In the jungles along the ridges of the eastern coast of South Andaman, appears to be indigenous, though I am not quite sure of it.
- ——myriocephala, DC.—On the ridges along the eastern coast of South Andaman, rare.
- *——amplectens, DC.—Phœnix Bay, cleared lands, introduced.
- *Zinnia.—Several species cultivated in gardens.
- Wollastonia scabriuscula, DC.—A most common plant along the beaches, and covering sometimes whole spots, from Macpherson's Straits to Middle Andaman, etc.
- Rudbeckia, Calliopsis, Coreopsis and Tagetes.—Cultivated in gardens.
- *Myriogyne minuta, DC.—Cultivated lands on Ross Island, around Aberdeen, etc., introduced.
- *Spilanthes oleracea, Linn.—Cultivated lands, Ross Island, rare, introduced.
- *Eclipta alba, Haenke.—Common on cultivated or cleared lands around Port Blair, introduced.
- *Blainvillea latifolia, DC.—Common on cleared lands around Hope Town and Aberdeen, introduced.

GOODENOVIACEÆ.

Scaevola Koenigii, Vhl.—A common shrub all along the beaches of South Andaman and adjacent islands. Pen-lay-tan, Birm.

GESNERACEÆ.

Æschynanthus sp.—In the forests of the eastern coasts around Haddo, Aberdeen and Phœnix Bay, etc., rather frequent.

MYRSINACEÆ.

- Maesa ramentacea, Wall.—On Viper Island as remainder of a centre of this shrub.
- Ardisia, sp. No. 1.—In the interior, especially of South Andaman, also between Homfray's Ghât and Port Mouat.
- sp. No. 2.—In the jungles around Port Blair.
- ——humilis, Vhl.—Common throughout the jungles from Rutland to Middle Andaman and adjacent islands.
- Ægiceras majus, Gaertn.—Rather common all over the islands along the beaches, and sometimes in the mangrove swamps themselves.

SAPOTACEÆ.

Bassia caloneura, Kurz.—A very common tree in the interior more level jungles north of Mangrove Bay. Paipan, Birm.

- Mimusops Indica, A. DC.—A most characteristic forest tree of the coasts, occupying there the fertile and level valleys exclusively. Kuppalee sheet, Birm.
- ——elengi, Linn.—In the jungles around Aberdeen and Mount Harriet. Khayah, Birm.

EBENACEÆ.

- Diospyros, sp. No. 1 (near D. melanoxylon).—A large tree in the jungles north of Mangrove Bay on indurated chloritic stone.
- -----sp. No. 2.—In the jungles around Mount Harriet, Aberdeen, etc.; Andamans: Liebig! Moong, Birm.
- Gardneri? Thw.—On the woody ridges around Port Mouat. A tree 40 to 50 feet high by 4 to 5 feet girth.
- ----sp.?-Southern coasts of Middle Andaman.
- Marcreightia Andamanica, Kurz.—A common shrub throughout the islands.
- Rospidios vaccinioides, Ldl.—A little tree, 25 to 35 feet high, in the jungles north of Mangrove Bay and Watering Cove.
- Erycibe sp. (near E. paniculata).—Only sterile plants seen at Macpherson's Straits.

OLEACEÆ.

- Chionanthus ramiflora, Roxb.—Steep hill sides along the western side of Watering Cove.
 - Linociera macrophylla and ramiflora, Wall, both belong here, also Chionanthus palembanica, Miq.

JASMINACEÆ.

*Jasminum.—Several species cultivated in the gardens of Europeans.

APOCYNEÆ.

- *Allamanda cathartica, Linn.—Cultivated in gardens. Pha-young-bau, Birm.
- Carissa diffusa? Roxb.—At Escape Bay towards the interior; very common on the Labyrinth Islands, as on Termoklee and Crab Island, Rutland, etc.
- Ophioxylon serpentinum, Linn.—Rather common in the jungles of South Andaman, as at Port Mouat, Port Blair, north of Mangrove Bay, etc.
- *Thevetia nereifolia, Juss.—Cultivated in gardens.
- Alyxia stellata, Roem et Schult.—In the forests around Port Mouat and near South Point at Port Blair.
- Cerbera odallam? Gaertn.—Here and there along the shores, more common along the western coasts, especially at Port Mouat. Kalwa, Birm.
- Lactaria salubris? Rumph.—Along the shores around Port Blair. Letshedah, And.
- Tabernaemontana Wallichiana? Steud.—All along the shores on the beaches, very common throughout the islands, also on Ross Island still remaining. Tsjelap, Birm.
- *Vinca rosea, Linn.—Cultivated and sometimes as wild.
- *Plumeria acutifolia, Poir.—Cultivated only.
- Alstonia spectabilis, R. Br.—In the jungles west from Black Creek. Let-htuk, Birm.
- Blaberopus??—In the jungles around Port Blair and elsewhere, rather common. *Nerium odorum, Sol.—Cultivated only.
- Ecdysanthera sp.—Common all around Port Blair and the eastern coasts to Shoal Bay. Toung-tha-lay, Birm.; dalangadah, And.

- Chonemorpha macrophylla, G. Don.—Along the steep ridges at the Southern Straits at Mangrove Bay, also around Port Mouat and elsewhere, frequent.
- Gen?-In the jungles around Port Mouat.

ASCLEPIADACEÆ.

- Tylophora carnosa, Wall.—Along the coasts at South Point and elsewhere.
- Sarcolobus carinatus, Wall.—Behind the mangrove swamps around Port Blair, rather frequent.
- Periploca sp.?—Rather common in the jungles around Port Blair.
- Cryptolepis sp.?-In the jungles around Port Mouat.
- Toxocarpus sp.?—In the bamboo jungles of Middle Andaman at Middle Straits.
- Dischidia nummularia, R. Br.—Common all over the islands and in abundance.
- Hoya sp.—Common throughout the shore and coast zone of these islands, also, but scarce, in the interior.
- ——öbtusifolia? Wight.—Common with the former, but more along the western coasts.

LOGANIACEÆ.

- Fagraea morindaefolia, Bl.—A tree of 50 feet in height (and not a climber as stated by Prof. Miquel in his Fl. Bat.) dispersed through the jungles of South and Middle Andaman Thsou-ma-gah, Birm.
- Strychnos laurina? Wall.—Very common all along the coast zone, especially along the western coasts. Kha-boung, Birm.

BIGNONIACEÆ.

- Calosanthes Indica, Bl.—Common all over the islands, especially in the deciduous forests. Baladah, And.; kyoung-sha, Birm.
- Spathodea Rheedii, Wall.—In the forests of Mount Harriet and elsewhere.
 Tha-khwot or malwa, Birm.
- stipulata, Wall.—In the forests around Aberdeen, rather rare. Hpetthan, Birm.
- Pajanelia multijuga, DC.—Common in the forests from Macpherson's Straits to Middle Andaman, not seen along the western coasts. Gogondah, And.; paethan, Birm.

CONVOLVULACEÆ.

- Ipomoea pes caprae, Sw.—A common creeper all along the sandy beaches throughout the islands, especially along the western coast. Penlay-ka-zwon, Birm.
- campanulata, Linn.—Along the beaches along the eastern coasts, rather frequent.
- cymosa? Roem. et Schult.—Only dried up plants seen, but seems frequent along Middle Straits and Bird-nest Cape.
- Argyreia? lanceolata, Chois.—Only sterile plants seen along the western coasts north of Port Mouat, and there in abundance.
- Batatas paniculata, Chois.—Rather common along the western coasts of South and Middle Andaman.
- *_____edulis, Chois.—Cultivated only. Kha-zwon, Biren,

- Calonyction Roxburghii, G. Don.—Cultivated only in gardens of Europeans.

 Nway-ka-zwon-a-phyoo, Birm.
- *Quamoclit vulgaris, Chois.—Cultivated in gardens, and now occurring as wild on Ross Island. Myat-laae-nee, Birm.

BORRAGINEÆ.

- Ehretia laevis? Roxb.—In the jungles around Phœnix Bay.
- Tournefortia viridiflora? Wall.—Rather common along the beaches and the coasts from Corbyn's Cove up to Middle Andaman.
- *Heliotropium Peruvianum, Linn.—Cultivated only.
- *Heliophytum Indicum, DC.—Cultivated lands around Aberdeen, rare and introduced.
- Cynoglossum micranthum, DC.—Between Aberdeen and Phœnix Bay, I suspect introduced only, as I saw it nowhere else.

SOLANACEÆ.

- *Solanum xanthocarpum, Schrad.—Cleared lands around Phœnix Bay and Aberdeen, introduced.
- *--- nigrum, Linn.—Cultivated lands around Aberdeen, rare, introduced.
- *---- verbascifolium, Linn.-Around Aberdeen, etc., introduced.
- *——— melongena, Dun.—Much cultivated in native gardens and occasionally as wild. Kha-yau, Birm.
- *---- argenteum, Dun.—Cultivated only in gardens.
- *Lycopersicum esculentum, Mill.—Much cultivated by native convicts. Khayau-mya-phung, Birm.
- *Capsicum.—Several species in cultivation by native convicts.
- *Datura sp.—Cultivated in gardens.
- *Nicotiana tabacum, Linn.—Cultivated on Mount Harriet, etc. Hsae, Birm.
- *Petunia violacea, Linn.—Cultivated in gardens.

SCROPHULARINEÆ.

- *Angelonia salicariæfolia, H. B.—Common in cultivated lands on Ross Island, introduced.
- *Russelia juncea and floribunda are cultivated in gardens.
- *Mazus rugosus, Lour.—Cultivated lands around Aberdeen, introduced.
- *Vandellia crustacea, Bth.—In cultivated lands around Port Blair, introduced.
- *Bonnaya veronicæfolia, Bth.—Cultivated lands around Aberdeen, introduced.
- *Scoparia dulcis, Linn.—Common all over the cleared lands around Port Blair and penetrating into the jungles, introduced.

ACANTHACEÆ

- Thunbergia laurifolia, Ldl.—Common throughout the forests from Middle Straits to Macpherson's Straits.
- Ebermayera glauca, Nees.—Sunny places behind Aberdeen in the jungles
- velutina, Nees.—On the ridge at Circular Bay near Port Mouat on clay.
- Hemiagraphis glandulosa, T. And.—Locally common, as at Hope Town, at Escape Bay, near Aberdeen, and on Termoklee Island.
- Dædalacanthus suffruticosus, T. And.—Common throughout the islands; rare, however, along the western coasts.
- Rungia pectinata, Ne.—Andamans.

- Acanthus ilicifolius, Linn.—Margins of the mangrove swamps at the Circular Bay, and between Aberdeen and South Point. Khaya, Birm.; Dundah, And.
- ebracteatus, Vhl.—More common than the former, at Phœnix Bay towards Haddo, Port Mouat, Muddy Creek, etc.
- *Graptophyllum hortense, Nees.—Cultivated in gardens.
- *Justicia gendarussa, Linn.—As the former.

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- Eranthemum album, T. And.—A most common plant in the jungles all over the islands, much varying in color of the flowers.
- Peristrophe sp.?—New Salt-works at South Point, along the shores rather frequent.

VERBENACEÆ.

- *Verbena aubletia, Linn. and other species.—Cultivated in gardens.
- *Stachytarpha Indica, Vhl.—Cultivated in gardens, at present covering all the sides of Ross Island and around Aberdeen.
- *Lippia nodiflora, Rich.—Cleared lands all around Port Blair, and becoming very fleshy along the sea shores, introduced.
- *Lantana mixta, Linn.—About Aberdeen, amongst the shrubberies as wild, but rare.
- *Duranta Plumieri, Jacq.—Cultivated only in gardens.
- Sphenodesma unguiculata, Schauer.—Common throughout the islands, especially along the eastern coasts. Geredah, And.
- Premna divaricata? Wall.—A climber along the western coast from Rutland to Port Mouat, Crab Island, etc., in abundance.
- Clerodendron inerme, R. Br.—Coast from Aberdeen to South Point, doubtfully wild.

- Gmelina arborea, L.—A large forest tree in the jungles around Mount Harriet, but was leafless.
- Vitex leucoxylon, Linn.—A large forest tree along the western coast of South Andaman, around Port Mouat, but also occurring around Port Blair. Kyet-yoh, Birm.
- *----- trifolia, Linn.-Only cultivated in gardens. Kyoung-ban, Birm.
- Avicennia officinalis, Linn. (sec. Schauer).—Common all along the shores, on the beaches, or even in the mangrove swamps.

LABIATÆ.

- *Ocymum sanctum, Linn.—Cultivated lands at Ross Island, introduced.
- *Salvia coccinea and splendens.—Sometimes cultivated in gardens of Europeans.
- *Leucas linifolia, Spreng.—Cultivated lands on Chatham Island, introduced and still rare.

Plumbagineæ,

*Plumbago rosea. L.—Cultivated in gardens.

PLANTAGINEÆ.

*Plantago major, Linn.—Cultivated in native gardens.

AMARANTACEÆ.

- *Celosia argentea, Linn.—Cleared lands around Haddo, rare, introduced.
- *Amarantus spinosus, Linn.—Cultivated lands around Phœnix Bay; introduced and rare. Heu-ka-nwak, Birm.—Several other species cultivated in native gardens.
- *Euxolus caudatus, Moq.—Rather common in cleared lands at Aberdelen, Ross Island, Haddo, etc.; introduced,
- *Alternanthera sessilis, R.Br.—Common in cleared lands along roads, etc., at Port Blair; introduced.
- *Gomphrena globosa, Linn.—Cultivated and sometimes as wild. Ma-hnyo-ban, Birm.

NYCTAGINACEÆ.

- *Mirabilis jalappa, Linn.—Only cultivated in garden. Myæ-za, Birm.
- Pisonia alba? Spanogh.—A large tree which occurs in great abundance at Muddy Creek, but also, though scarce, at Mount Harriet and elsewhere.

POLYGONACEÆ.

*Polygonum, sp.—Some shoots of species of this genus I observed in the cultivated lands around Haddo, evidently introduced.

I de restil a Lauraceæ.

- Haasia sp.—A tree 40 to 50 feet high behind the mangrove swamps of Port Mouat; rather frequent.
- Tetranthera, sp. No. 1.—In the jungles at the Black Creek.
- laurifolia, Jacq.—Rather common throughout South Andaman, especially along the eastern coasts.
- Port Mouat.
- Actinodaphne sp?—In the jungles along the eastern coasts.
- Cassytha filiformis, Linn.—At the beach at Shoal Bay and on the precipices of Crab Island, frequent.

MYRISTICACEÆ.

- Myristica Irya, Gærtn.—Rather frequent throughout the jungles of South Andaman, especially around Port Blair. Malaw, Birm.; mudoondah, And.

- sp. (with large fruits and blood red arillus).—Only the fruits seen in the jungles around Aberdeen.

HERNANDIACEÆ.

Hernandia peltata, Meisn.—Along the beaches at Escape Bay rare, more frequent along the western coasts between Port Mouat and Island Bay.

BEGONIACEÆ.

Begonia Andamanensis, Parish.—On the densely wooded ridges at the southern entrance of Port Mouat, Port Blair. Revd. Parish.

PAPAYACEÆ.

*Papaya vulgaris, DC.—Cultivated and spontaneously springing up around Port Blair. Themban-thee, Birm.

ARISTOLOCHIACEÆ.

Bragantia tomentosa, R. Br.—A common plant throughout the islands; more plentiful, however, along the eastern coasts.

EUPHORBIACEA.

- Amanoa attenuata, Wall.—Common in the jungles around Port Blair.

 I am unable to distinguish Nanopetalum myrianthum, Hassk., from this species.
- Actephila Javanica ? Miq.—Common in the jungles of South Andaman and the adjacent islands.
- sp. No. 2.—Common throughout the islands, and in many places a prevalent type of the shrubby vegetation.
- Antidesma Ghæsembilla, Müll. Arg. Shores north of Port Mouat.
- Phyllanthus reticulatus, Poir.—At Muddy Creek, South Corbyn's Cove, etc., along the shores.
- Helferi Muell. (Ph. Andamanicus, Kurz.).—Behind Aberdeen, at the path to Phœnix Bay.
- Breynia sp.—Ross Island, South Corbyn's Cove, and elsewhere, behind the mangroves especially.
- Baccaurea sapida, Müll. Arg.—Throughout the jungles, but only in single specimens. Kanazo or ganet-thoo, Birm.
- Aporosa microcalyx? Hassh.—In the interior west of Black Creek.
- ———— Roxburghii, Wall.—Along the sea shores on the sandy beaches near South Point and Aberdeen.
- dioica? Müll. Arg.—In the jungles around Phœnix Bay.
- Cyclostemon macrophyllum, Bl.—In the interior west of Black Creek in single individuals.
- Hemicyclia Andamanica, Kurz.—A tree 40 to 50 feet high, in the level jungles at Port Mouat and around Escape Bay in abundance.
- Briedelia tomentosa?? Bl.—Along the shores and beaches common, especially along the eastern coasts of South and Middle Andaman.
- Lepidieropsis orbicularis, Müll. Arg.—On Crab Island common.
- Croton umbellatum, Willd.—Exceedingly common throughout the jungles, especially at Macpherson's Straits, South Corbyn's Cove, etc.
- ---- sp. No. 2.—In the coast jungles at South Point.
- pendulus? Hassk.—Only sterile shrubs seen around Aberdeen.
- Agrostistachys Indica, Dalz. var. B. longifolia, Müll. Arg.—In the jungles around Port Blair. Toung-hma-yoh, Birm.
- Claoxylon sp. (=4731 Hb. Helf. = Croton oxyphyllum, Wall).—A little tree or shrub common throughout the jungles of the Andamans, especially around Port Blair; Chownoo, Birm.; bomadah, And.
- sp. ? (No. 1.)—Common around Mount Harriet, Aberdeen, etc.
- .____ sp. No. 2.—In the jungles around Port Blair.



- Mallotus sp. No. 1.—A most common shrub or small tree throughout the islands. -sp. No. 2.—Rather common along the coasts, especially at Progress Creek, and on the Labyrinth Islands. -muricatus? $M\ddot{u}/l$ Arg. (= Claoxylon No. 7 Hb. Hf. et T.).—Very common throughout the islands and adjacent Labyrinth Archipelago. -philippinensis, Müll. Arg. - A tree in the interior, north of Macpherson's Straits, and around Port Blair. Thoung-the-din, Birm. Macaranga Indica, Wight. -- A tree often attaining a height of 50 to 60 feet at Macpherson's Straits; at Jolly Peninsula an entire jungle of this species exists. -tomentosa, Wight.--South point to Aberdeen and elsewhere in the shore jungles. *Ricinus communis, Linn.—Cultivated only. Khyet-hsoo, Birm. Bennettia sp. ??—Along the western coasts around Port Mouat. *Jatropha multifida, Linn.—Cultivated only. *Curcas purgans, Med.—Cultivated only. Them-ban-kyet-shoo, Birm. Trigonostemon sp.—Rather frequent throughout the jungles, especially along the western coasts. Codiæum moluccanum, Dene.—Cultivated only. Gelonium bifarium, Roxb.—Middle Andaman, along Middle Straits in bamboo jungles. Excecaria agallocha, Linn.—A characteristic shrub or little tree especially on Middle Andaman, but common along the shores of all these islands behind the mangroves. Ta-yau, Birm.; gairegedah, And. *Euphorbia pilulifera, Linn.—Cultivated lands around Port Blair common, introduced. -thymifolia, Burm.—Along roads, in cultivated lands, &c., around Port Blair, introduced. --atoto, Forst.—On the sand beaches at Escape Bay near South Point. -trigona? Haw.—At South Corbyn's Cove along the left side of the creek. *————pulcherrima, Willd.—In gardens, cultivated. Ryparia caesia, Bl.—In the jungles around Aberdeen, Mount Harriet, etc. Grooh, Birm.
 - URTICACEÆ.

Gen-dub, Euphorbiaceae?—In the jungles around Port Blair, especially at

Gen-dub.—In the bamboo jungles at Middle Straits on Middle Andaman.

Aberdeen. Toung-the-din-boe, Birm.

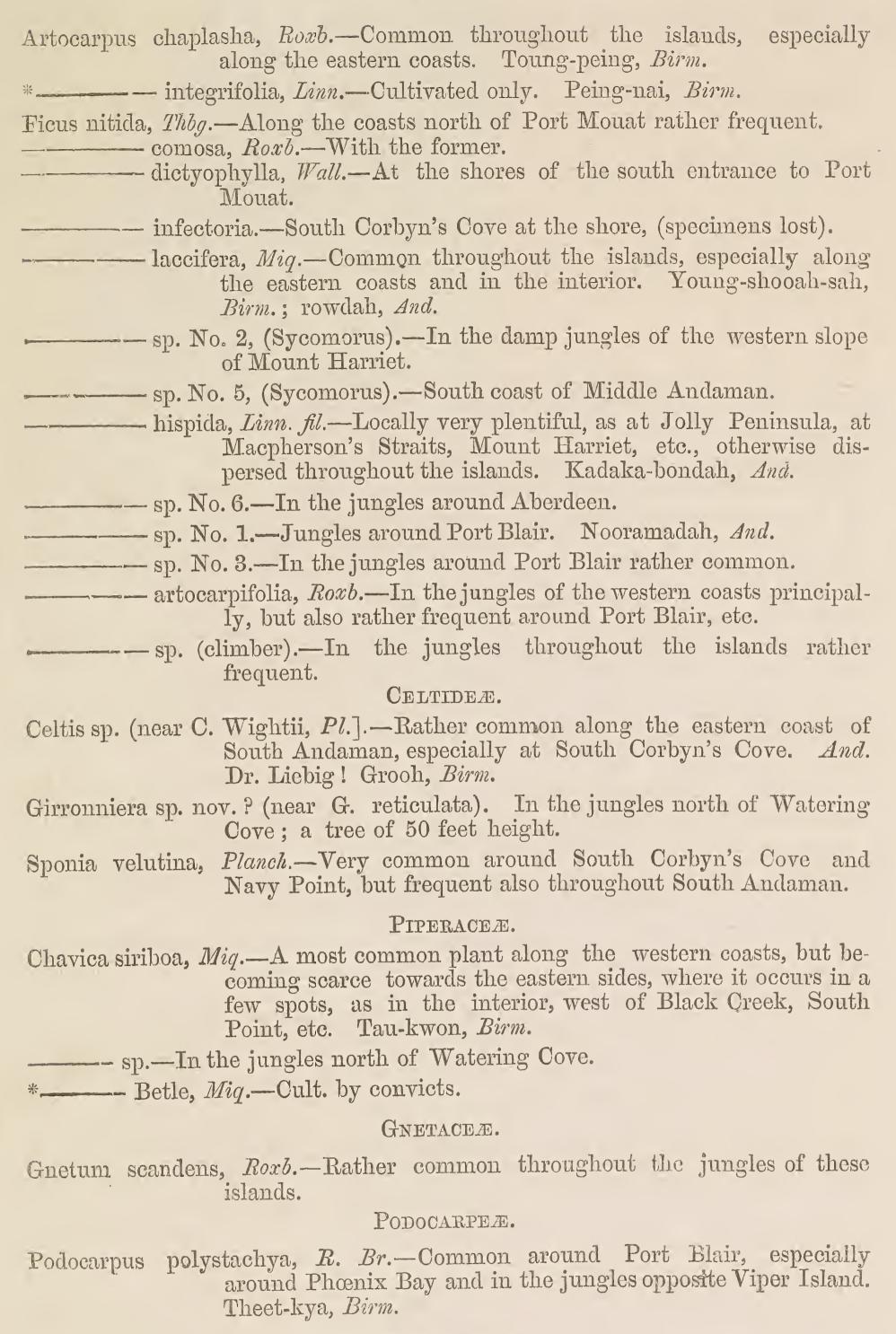
Elatostemma sesquifolium, Hassk.—In damp places west of Black Creek in the interior; also north of Port Mouat, and elsewhere.

*Cannabis sativa, Linn.—Cultivated only.

MORACEÆ.

Epicarpurus orientalis, Bl. Common throughout the jungles from Rutland to Middle Andaman. Un-nehl, Birm.; jindah, And.

Plecospermum spinosum, Tul.—Rather frequent along the western coasts around Port Mouat, and on the Labyrinth Islands; further, at Bird-nest Cape, etc.



CASUARINEÆ.

*Casuarina equisetifolia, Forst.—At Ross Island, cultivated.

CYCADEÆ.

Cycas Rumphii, Miq.— All along the eastern coasts of South Andaman. Mudaing, Birm.; gneberdah, And.

B.- MONOCOTYLEDONES.

PALMÆ.

- Calamosagus laciniosus, Griff.—Common all over the jungles, especially along the eastern coasts. Burdah, And.
- Calamus sp. No. 4.—Western coasts of South Andaman, and both shores of Middle Straits; also on Rutland and the Labyrinth Islands.

- *Areca catechu, Linn.—Cultivated, especially at Aberdeen. Kwon-thee, Birm.
- Ptychosperma Kuhlii? Miq.—On Mount Harriet.
- Caryota sobolifera, Wall., (but the fruits are globose). Macpherson's Straits; between Aberdeen and Navy Point, western coasts of South Andaman, Termoklee Island, Rutland, and elsewhere, but nowhere in greater quantity.
- Phœnix paludosa, Roxb.—Common along both shores of Middle Straits. Then-boung, Birm.
- I am informed that another species of Phœnix occurs on the Cinque Islands with edible fruits. (Ph. sylvestris?)
- Corypha macropoda, Kurz.—On Termoklee Island only. Dundah, And.; paë, Birm.
- Licuala paludosa, Griff.—Behind the mangroves at both shores of Middle Straits, also at Circular Bay of Port Mouat.
- Cocos nucifera, Linn.—Only on the Cocos Islands indigenous. Now everywhere cultivated and sown along the shores. Ung, Birm.
- Nipa fruticans, Wurmb.—The Nipa palm does not occur so abundantly, and is confined to a number of centres, as at Port Blair, Camping Bay, etc. Da-ne, Birm.

PANDANACEÆ.

- Pandanus verus, Rumph.—A most common plant all along the shores of the Andamans. Oodelet, And.; hsat-ta-phu, Birm.
- Andamanensium, Kurz.—Common, especially abundant in the coast zone, but also frequently met with in the interior. Mungdah, And.
- ————Leram, Jones.—With the former.
- Freycinetia radicans,? Gaud.—Common in damp forests north of Viper Island, along the western coast of South Andaman, around Port Mouat, on Mount Harriet, South Point, etc.

AROIDEÆ.

Amorphophallus longistylus, *Kurz.*—Common around Port Mouat and along the whole western coast; rare at Phœnix Bay.

- Alocasia fornicata, Schott.—Rather common in the forests, especially along the eastern side of South Andaman.
- Scindapsus pertusus, Schott.—Common all over South Andaman and adjacent islands.
- ----- officinalis, Schott.—With the former and equally common.
- Pothos scandens, Linn.—Exceedingly common, but growing more luxuriantly along the western coasts.

HYDROCHARIDEÆ.

Enhalus Kœnigii, Rich.—Common in the sea along the western shore at Purslane and Botanist's Creek, also at Termoklee Island.

DIOSCOREACEÆ.

- Dioscorea glabra, Roxb.—Common throughout the islands.

IRIDEÆ.

*Pardanthus sinensis, Ker, and some other Iridaceæ observed in gardens; cultivated.

BURMANNIACEÆ.

Tacca pinnatifida, Aut. (an Forst?).—Common on Crab Island, one of the Labyrinth Islands. Touk-ta, Birm.

ORCHIDEÆ.

- Liparis sp?—Along the western coast in damp places, as for instance at Port Mouat and near Homfray's Ghât.
- Microstylis trilobulata, Kurz.—Andaman Island.
- Dendrobium crumenatum, Swartz.—Very common on trees throughout the islands, especially in the mangrove jungles.
- sp. 3. (Aporum, near A. Serra).—Locally very common, as for instance at the south coast of Middle Andaman, at Port Mouat, and especially at Mangrove Bay.
- Bolbophyllum sp. (near B. trisetosum, *Griff*: and Oxysepala ovalifolia, *Wight*).—Rather common in the mangrove jungles throughout the islands, especially at Circular Bay near Port Mouat.
- Eria Kurzii, T. And.—Common in the mangrove jungles throughout the islands, especially around Port Blair.
- ——elongata? Lindl.—Rather frequent in the mangrove jungles along the eastern coasts of South and Middle Andaman, also at Jolly Peninsula and around Port Mouat.
- Pholidota imbricata, Smith.—Common all over the islands in the mangrove jungles.
- Eulophia sp.—Common along the western shores north of Port Mouat, on Rutland, at Jolly Peninsula, and north of Mangrove Bay.
- Luisia sp.?—On trees at the beaches of Jolly Peninsula.
- Vanda No. 1. (fl. white).—On trees on Mount Harriet.

- Vanda teres, Lindl.—In the mangrove jungles at Flat Shallows, Rutland, Labyrinth Islands, along the western shores north of Port Mouat, and in the interior north of Escape Bay.
- Tæniophyllum normale, Kurz.—On trees in the mangrove swamps of Port Mouat.
- Cleisostoma sp. (an Cl. galeata, Thw.?).—A common plant throughout the islands, especially on trees along the beaches.
- Appendicula sp.? (or Agrostophyllum?).—Rather common in the mangrove jungles around the coasts of South Andaman, especially around Port Blair.
- Cymbidium aloifolium, Sw.—Common throughout the islands along the shores. Acriopsis? sp.—In the mangrove swamps at North Bay.
- Peristylus sp.—(= No. 5357, Hb. Helf.)—Common on the ridge opposite the settlement at Port Mouat.
- Vanilla sp.—Dispersed throughout the islands; also in the interior.
- Aetheria sp.—In the moist jungles near South Corbyn's Cove (specimens lost). Tropidia curculigioides, *Ldl.*—Near the settlement north coast of Port Mouat, along the little creek.

ZINGIBERACEÆ.

- Globba expansa, Wall.---In the bamboo jungles north of Watering Cove.
- Curcuma Roscœana, Wall.—In the bamboo jungles north of Watering Cove, and especially at South Point; common.
- *____Several species cultivated.
- Kæmpferia pandurata, Roxb.—In the bamboo jungles north of Watering Cove. Amomum aculeatum, Roxb.—Common around Navy Point, Aberdeen, Watering Cove, and some other places.
- Alpinia sp. ?—Only sterile plants observed locally, but throughout the parts visited.
- Costus speciosus, Smith.—Common throughout the islands, in the forests. Palang-toung-wae, Birm.
- Zingiber cassumunar, Roxb.—Common between Port Mouat and Homfray's Ghât, along the whole western coast, and in the interior north of Mangrove Bay.

MARANTACEÆ.

- Maranta dichotoma, Wall.—A most common plant throughout the islands. Odoradah, And.; pen-bwa, Birm.
- Phrynium parviflorum.—Locally very common, as at Lighter Bay, on the Labyrinth Archipelago, around Port Mouat, at South Point, etc. Goobdeegudah, And.
- sp. (small plant with metallic leaves).—Common along the eastern coasts of South Andaman, west of Black Creek, at Macpherson's Straits, etc.
- *Canna Indica.—Cultivated in gardens and sometimes wild in jungles, where it has been sown. Budda-tharava, Birm.

MUSACEÆ.

- Musa simiarum? Rumph.—Especially in the interior of South Andaman, in damp forests rather frequent.
- * --- alphurica, Rph.—Cultivated everywhere. Hnget-pyau, Birm.

BROMELIACEÆ.

*Ananassa sativa, Lindl.—Now everywhere cultivated, and producing fruit of good quality. Na-nat, Birm.

AMARYLLIDEÆ.

Crinum toxicarium, Roxb.—Common along the sandy shores of these islands, often forming a stem four feet high by half a foot in diameter. --- ornatum? Herb.—Rather rare along the shores of the north coast of Port Blair. *Zephyranthes, Hippeastrum.—Several Crina may be found cultivated in gardens. LILIACEÆ. *Allium sativum, Cepa and porrum.—Cultivated in gardens. Asparagus racemosus, Roxb.—Common throughout the islands along rocky shores. Sheetma-tet, Birm. Cordyline terniflora, Planch. - Common throughout the jungles, especially in the northern parts of South Point. -- sp. No. 2.—On the ridges at Flat Shallows, a large shrub 30 feet by 3 feet girth. --- sp. No. 3.-Rather frequent throughout the jungles of South Andaman, especially around Port Blair. in damp jungles. ----- Rumphii, Hook. -- At South Corbyn's Cove very common. Gloriosa superba, Lam.—And., Dr. Playfair! Hsee-mee-touk, Birm. Smilax ovalifolia, Roxb.—Common throughout the islands. Ku-ku, Birm. COMMELYNACEÆ. Aneilema ovatum, Wall.—Near Homfray's Ghât in damp jungles, also north of Watering Cove. Aclisia Indica, Wight.—Common between Homfray's Ghât and Port Mouat; north of Mangrove Bay, Watering Cove, etc. Pollia thyrsiflora, Endl.—In the interior of the forests north of Mangrove Bay; rather scarce. Flagellaria Indica, Linn.—Common all over the islands, and, when young, often quite covered by a white powder. CYPERACEÆ. Scleria lithosperma, Willd.—Common all along the western coasts of South and Middle Andaman; also south coast of Middle Andaman, Escape Bay, Rutland, Termoklee, etc.; always on indurated chloritic rock. Pandanophyllum Zeylanicum, Thw.—Very abundant in the jungles north of Viper Island; also at Escape Bay in the interior. Hypolytrum trinervium, Kth.—In the forests around Aberdeen and elsewhere along the eastern coasts. Sandstone formation. Dshouwleedah, And. -latifolium, Rich., var. gracilis. -- On Termoklee Island common. Serpentine and indurated chloritic rocks. Fimbristylis sp. (foliis setaceis strictis). - Bird-nest Cape common along the rocks (specimens lost). -sp. (scaberrima Nab. E.?).—All along the coasts north of Port Mouat, but quite dried up at my visit. -Andamanica, Kurz.-Both coasts along Middle Straits in the man-

-miliacea, Vhl.—Cultivated lands around Haddo; introduced,

-diphylla, Vhl.-Common all over the cleared lands around Port Blair;

grove swamps.

introduced.

*Fimbristylis sp.—Cultivated lands and gardens around Port Blair; cultivated. Cyperus mæstus, Kth.—In the jungles, especially around Phænix Bay, Aberdeen ——sp. near C. mœstus, Kth. (=No. 6162, Hb. Helf.)—Rather common in the forests around Phænix Bay, Mount Harriet, etc. —canescens, Vhl.—(=6159 Hb. Griff.)—Inhabits the mangrove swamps and open lands, as at Flat Shallows, on Bird Island, near Viper, around Haddo, etc. pilosus?? Vhl.—Jungles at South Point. *——polystachyus, Vhl.—Cultivated lands between Aberdeen and Navy Point; introduced. *——distans, Kth.—Ross Island and other stations, in pasture ground; introduced. ----dilutus, Vhl.-In the forests around Port Blair and elsewhere, not uncommon. *---rotundus, Linn.—Exceedingly common in cultivated lands, especially on Ross Island; introduced. * ____compressus, Linn.—Cultivated lands here and there around Port Blair, introduced. *——Fria, Linn.—Rather rare; in wet places at Ross Island, etc., introduced. *Kyllingia monocephala, Linn.—Cleared lands around Port Blair; introduced. -triceps, Linn.—Common along the cleared lands, and extending far into the jungles. I am not sure if this species is really indigenous. GRAMINEÆ. *Oryza sativa, Linn.—Only in small quantities; cultivated. Saba, Birm. *Zea mays, Linn.—Cultivated in gardens, and sometimes as wild. Pyoungboo, Birm. *Coix lachryma, Linn.—Cultivated in gardens. Kalethee, Birm. *Paspalum scrobiculatum, Linn.—Cultivated lands around Port Blair; introduced *Eriochloa annulata, N. E.—On Ross Island; introduced. *Panicum (Digitaria) sanguinale, Linn.—Cultivated lands around Port Blair; introduced. *____(Digitaria) sp.—Cultivated lands on Ross Island; introduced. *____(Digitaria) ciliare, Retz.—Common in cultivated lands around Port Blair; introduced. -Javanicum. Poir.—Around Phœnix Bay; seems introduced with hay from Bengal. ——(Oplismenus) compositum, Linn.—Locally throughout the jungles from Macpherson's Straits to Middle Andaman, especially in bamboo jungles. -(Oplismenus) album, Poir.—Between Flat Shallows and Port Mouat; rather common in bamboo jungles. (Echinochloa) crus galli, Linn. var. colonum.—South Point, Aberdeen, etc., in cultivated lands; introduced. *Panicum trigonum? Retz—Around Hope Town, evidently introduced. *___jumentorum, Pers.—Cultivated at Ross Island and Aberdeen (Guinea grass). Ischæmum muticum, Linn.—Exceedingly common along the western shores north of Port Mouat; rather scarce all along the eastern coasts. Pogonatherum saccharoideum, P. B.—Barren Island.

*Chrysopogon aciculatum, Trin.—Common on Chatham Island; introduced.

- *Andropogon pseudo-ischæmum, N. E.—Cultivated lands and gardens at Ross Island; introduced.
- *————polystachyos? Roxb.—Only in garden land on Ross Island; introduced.
- *Sporobolus Indicus, R. Br.—Common on Chatham Island; introduced.
- *Saccharum officinarum, Linn.—Cultivated by convicts. Kyan, Birm.
- *Cynodon dactylon, Pers.—The favourite grass here; everywhere sown, and now occurring wild on the cleared lands.
- *Leptochloa filiformis, R. et Sch.—Along the path from Phœnix Bay to Aberdeen, scarce; introduced.
- *Eleusine Indica, Gaertn.—Cultivated lands everywhere around Port Blair; introduced. Hsen-gno-myeet, Birm.
- *Dactyloctenium aegyptiacum, Willd.—Cultivated lands on Ross Island; introduced.
- Chloris digitata, Steud.—Sandstone ridges at the south entrance of Port Mouat rather frequent.
- Centotheca lappacea, Desv.—In the jungles throughout the islands, not uncommon.
 - Melica diandra and refracta, Roxb., should be referred to this species.
- Bambusa Andamanica, Kurz. (certissime non B. nigro-ciliata Büse.)—The most common bamboo, forming whole jungles in the interior and at Middle Straits, following the formation of serpentine and indurated chloritic rocks. Ootal, And.
- Teinostachyum schizostachyoides, Kurz.—In the jungles at Macpherson's Straits.
- Dinochloa tjangkoreh, Büse.—Forming nearly half of the whole scandent vegetation in these jungles, and rendering many places nearly impenetrable. Baradahbarat, And.
- Graminea No. 1. (indeterminable).—Macpherson's Straits along the sandy beaches.
- No. 2.—A glaucous stiff grass on the rocky shore of Termoklee Island; common; sterile.
- Andropogonoidea No. 1.—Along the slopes of the Bird-nest Cape common, entirely dried up specimens only found.
- ____No. 2.—With the former, in the same state.
- ———No. 3.—Brought by the deputation from Barren Island.

CRYPTOGAMS.

LYCOPODIACEÆ.

Lycopodium phlegmaria, Linn.—Occurring especially in the mangrove swamps or in their vicinity, Mount Harriet, Homfray's Ghât, Phœnix Bay, etc.,; not seen, however, anywhere in the interior.

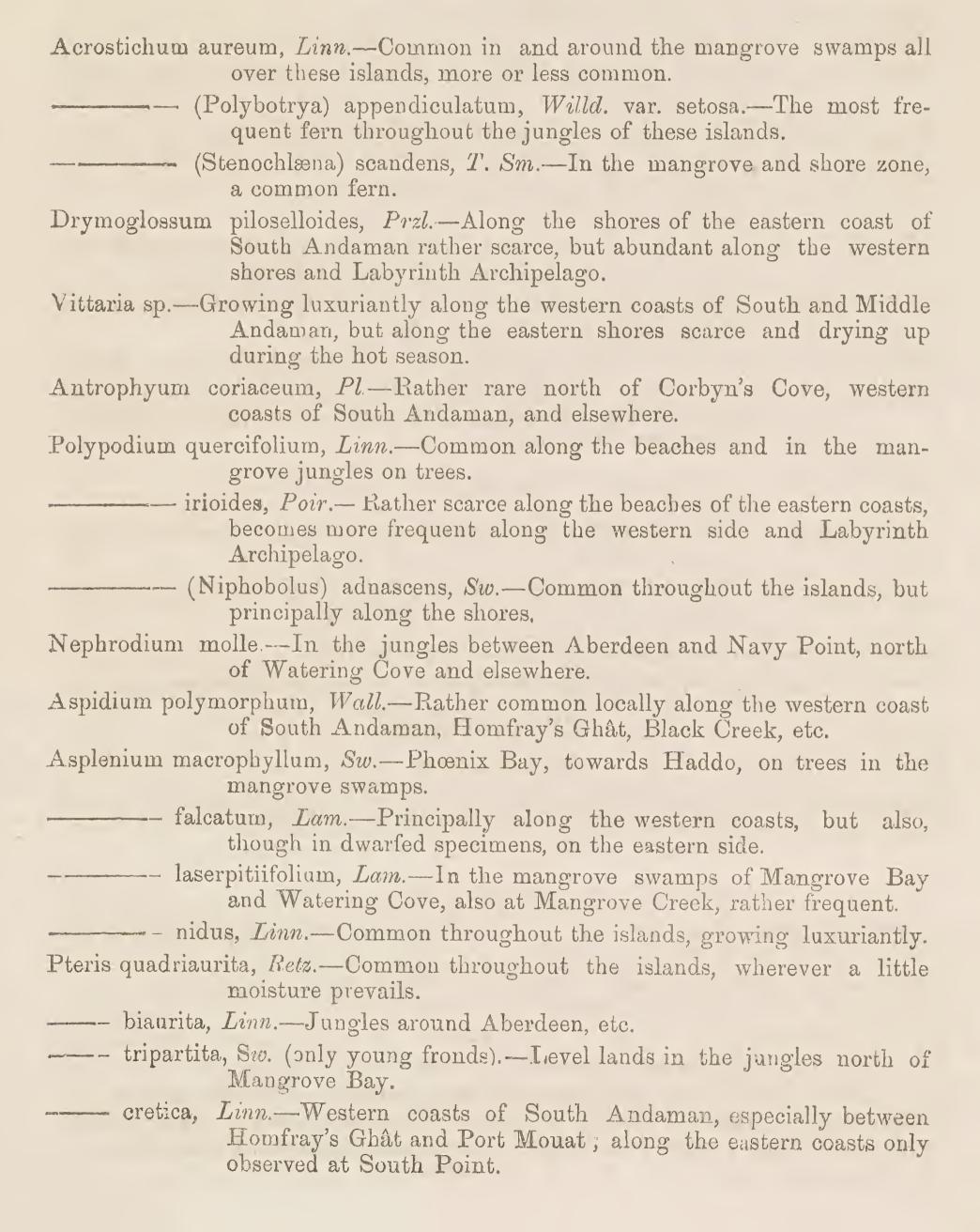
SCHIZÆACEÆ.

- Lygodium circinnatum, Sw.—Common throughout the islands, especially along the western coasts.

FILICES.

Ferns are comparatively numerous, but are mostly species of a wide range and well adapted to bear a considerable degree of drought. The only striking forms here are Davallia parallela and several Hymenophyllaceæ. Some of them, however, I found totally shrivelled up in April; amongst them Vittaria, Davallia, Asplenium falcatum, and the few Hymenophyllaceæ.

The great scarcity of Aspidieæ (only one species, and this very scarce) is remarkable. Those splendid tree ferns, so characteristic of a moist and well-watered tropical country, which occur also on the opposite coasts of the continent, have nowhere been found here. The most common forms are here Polybotrya setosa on the ground, and Aspelee nium nidus on the trees throughout the forests. Along the sea shores, Acrostichum aureum is abundant in the swamps; Polypodium quercifolium and irioides epiphytic, and Stenochlæna scandens as a climber. Comparing the ferns of the Andamans with those of Burmah, the proportion is nearly 1 to 7. Budmar is the name which the Andamanese give to the ferns generally.



Adiantum lunulatum, Burm.—On clay soil at the little bay south of the entrance to Port Mouat, seen nowhere else. Lindsæa tenera, Dry.-Phænix Bay, frequent along the road to Haddo and Aberdeen; Port Blair: Dr. Liebig! davallioides, Bl.—Common on the woody ridges north of Viper Island. Davallia solida, Sw.—Here and there along the coasts of South and Middle Andaman, Rutland and Labyrinth Islands, mostly in mangrove swamps. Ghât in abundance. -- polypodioides, Don.-Level lands in the interior north of Mangrove Bay, in damp jungles. Trichomanes delicatulum, Kurz.—On trees in very moist localities at the eastern slope of Mount Harriet, and in the mangrove swamps around Phœnix Bay. Differs from T Henzaiense by the sessile sori. Rev. Parish's observation requires confirmation. Javanicum, Bl.—Only a few specimens found in very wet localities at South Point. * rigidum, Sm. - Andamans: D. Ball. filicula, Bory. -- In the damp forests of the western coasts of South Andaman, around Port Mouat, and on Rutland Island. pyxidiferum, L.—Southern side of Mount Harriet, common on wet stems of trees. Kurzii, Bedd.—Eastern side of Mount Harriet, and in the mangrove jungles around Phænix Bay rather frequent.

Musci.

but they are hairy.

In the figure given by Major Beddome the stopes appear glabrous,

Mosses are less numerous, as might be expected, and do not occur in such dense patches as we are accustomed to see them on more southern islands. Only in the mangrove swamps along the sea little patches may be found of Leucoble-pharum albidum (common), Macromitrium and Calymperes. A Leucobryum is often common in the higher tops of the trees in the interior. A little Fissidens in company with some scalemosses and lichens covers in places the rocks in the torrents with an agreeable green, but at the time I was there they were dried up so, that they broke when touched. Another species of this genus is found sometimes on moist fertile soil. Only about 16 or 17 species have been detected by me; but there is a number which I neglected, because they were altogether without fructification, and totally dried up. The genera most represented are Macromitrium, Hypnum, Fissidens, Calymperes, Leucobryum, Octoblepharum and Neckera.

HEPATICÆ.

Scale mosses like mosses appear chiefly adhering to the stems or leaves of trees or growing on the rocks. Only in a few very moist localities, as for instance in the larger mangrove swamps and along the shady slopes of Mount Harriet, are they found in loose patches. Their number, it is remarkable, supercedes that of the mosses, as is the case also on the Galopagos islands. The number which I collected may be 18 or 19. Amongst them the genera Plagiochila, Mastigobryum, Lejeunia, and Frullania.

As in lichens also no forms are found here growing exclusively on earth, as Marchantiaceæ. Also no Ricciaceæ occur in the fresh waters. Epiphyllous forms, on the contrary, are most developed, though not numerous in species.

LICHENES.

Lichenes are more numerous than any of the other cryptogamic classes, except fungi and marine algæ. They cover not only the stems of certain trees in great variety, principally along the coasts, but inhabit also the rocks and reefs, which are not reached by the sea. No large forms, however, are to be found here, nor any Ramalina or Usnea, which in other moist tropical forests, whenever a little elevated, give such a strange wintery aspect to the landscape. Also not a single Cladonia or any other terrestrial form has been observed. The great profusion of epiphyllous forms, though not rich in species, principally in the interior, where the cortical lichens diminish greatly in number of species as well as of individuals, is also worthy of notice.

The number of species found by me may be about 36 or 40 species. Amongst them are the genera Opegrapha, Graphis, Lecidea, Parmelia, Lecanora, Arthonia, Physcia, Verrucaria and Trypetelium.

ALGÆ.

I observed a few fresh-water Cladophoræ of a green colour during the hot season on the rocks of the dried-up torrents, but altogether in such a state as to be unfit for determination. I found in July a Batrachospermum attached to bamboo canes, and fine patches of a Mougeotia in the creeks north of Watering Cove, as also an Oscillatoria (?) of a dark-green colour all along the water-courses on Ross Island.

The number of seaweeds is not so large, as might be expected from the numerous reefs and rocks surrounding the coasts. Fucaceæ are not numerous in species, though some Sargassum exists in great quantity.

The great number of the very small species, which occur between the various splendid and bright coloured corals, were too much entangled amongst each other to permit me to collect them free from other substances, so that they might have been recognized afterwards in a dried state.

In the brackish mangrove ditches only two or three green coloured confervæ were observed floating and submerged. I do not include Diatomaceæ and such microscopic forms, which can be observed only by the aid of powerful glasses.

The number of species of Algæ brought home by me may be about 34 or 36. Amongst them appear to be Oscillatoria, Spirogyra, Conferva, Chætophora, Ulva, Codium, Batrachospermum, Turbinaria, and several genera of Corallines. The following have been determined by Prof. G. v. Martens, who kindly communicated to me the names:—

Phycoseris lobata, Kg.—On sandstone rocks at Camping Bay.

Enteromorpha intestinalis, Link. var. capillaris, Kg.—In brackish and salt waters of the mangrove swamps along South Andaman.

polyclados, Kg.—Ross Island, at the jetty very frequent, and covering the sandstone rocks with an agreeable green.

Bryopsis tenuissima, Moris.—Camping Bay on sandstone rocks.

Halimeda discocdea, Dine.—Frequent on coral reefs all along the coasts.

-----opuntia, Soland.—Only ejected from the sea along the beaches.

Sargassum microcystum, Kg.?—(Young and uncertain, being destitute of cysts and fruits). Very frequent all along the coastson rocks and banks, but nowhere in full grown specimens.

Carpacanthus ilicifolius, Turner, vol. i. t. 51.—Termoklee Island, in deep sea. Zonaria Fraseri, Greville.—Very frequent on sandstone rocks in the sea, especially at Camping Bay.

- jania adhaerens, Lamourx.—Coral reefs at Camping Bay (when fresh, lively violet-coloured).
- Galaxaura plicata, Kg.—Frequent on coral reefs and frequently ejected from the sea along the beaches.
- Halymenia tenuispina, Kg., Tab. Phyt. vol. xvII, t. 2, f. 1.—On other fuci ejected from the sea.
- Acrocarpus intricatus, Kg.—On the roots and stems of mangrove trees, as far as they are submerged during the tide; Circular Bay at Port Mouat frequent.
- Sphaerococcus multipartitus, ϵ . lichenoides, Ag.—(Fucus aeruginosus, Turner, vol. III. t. 147 f).—Ejected from the sea and rather frequently seen along all the coasts.

Fungi.

The class of fungi is at first sight, when only exploring the eastern parts of South Andaman in April and May, nearly confined to Polyporini. There was scarcely an Agaricus to be found, nor any Peziza, nor those phantastic forms which attract our attention in other tropical forests: I mean the Phalloidei.

When, however, exploring the western coasts at Port Mouat in the same months, numerous agarici appeared; the fallen leaves were sometimes covered by Sphæria-like forms and Polyporini of a less leathery consistency. Mucorini and other deciduous forms in great variety were observed on decayed parts of plants. Such a change, trifling as it may appear, is of high interest, as it is quite in unison with the greater moisture along the western parts and the greater amount of decaying vegetable matter in the soil.

After the rains had set in, the variety of forms increased rapidly. Forms appeared and disappeared as quickly as the days passed, and a little spot with decayed wood would have given opportunity for a whole year's observation.

My numerous other duties did not allow me to enter into a minute examination of these plants, nor was I able to preserve these little forms from want of the necessary shelter in the jungles. The number of the species collected is only 27 or 28, and these are all large sorts.

The genera and species most frequently observed by me were Agaricus (many species); Coprinus (on Ross Island); Lactarius; Russula; Lentinus; Xerotus; Schizophyllum; Boletus (several species); Polyporus (numerous species); Thelephora; Clavaria; Tremella; Exidia (two species); Dictyophora phalloidea (at Port Mouat); Cynophallus caninus (sed apice perforato) common on bamboo trunks north of Mangrove Bay; Trichia; Puccinia; Ustilago; Æcidium; Leotia lubrica, Peziza; Bulgaria (amongst others, one gelatinous species as large as a child's fist, of a brownish colour, on Crab Island); Hypoxylon (several species); Sphæria (many species); Mucor and allied genera in abundance; Byssus; Rhizomorpha and a great number of others unknown to me.

APPENDIX B.

Report on the Forests of the Andaman Islands by Mr. S. Kurz, Curator of the Herbarium, Royal Botanical Gardens, Calcutta.

In submitting this Report on the timber trees and on their conservation, commenced around Port Blair, I beg leave to remark that, in spite of all the seeming completeness of my lists, hereafter offered, a vast field remains open for further explorations. I even believe that I have accumulated scarcely more than two-fifths of the existing kinds of forest trees, and I remain still unacquainted with the character of the forests north of Middle Andaman, of the Archipelago, and of Little Andaman.

State of Forest Department at Port Blair.—I have visited the forests around Aberdeen and Mount Harriet, where forest operations seem to have taken place. The trees commonly girdled were almost exclusively ganggo, Mesua ferrea, padouk, Pterocarpus dalbergioides, and pyenma, Lagerstroemia. They were girdled indiscriminately without taking consideration of their girth or the density of their growth. I noted many ganggos girdled between two and three feet girth. These trees were only partially branded with the hammer. The girdling, I suppose, has been accomplished by natives only, without the supervision of an experienced officer.

Major B. Ford's Report.—Major B. Ford, the present Superintendent of Port Blair, has given some statistical accounts of the state of the Forest Department on the Andamans, and also the proportional constituents of those forests, in his Report to the Government of India for 1864-65.

Forests practically reviewed.—The Andamanese forests are characterized by the very dense growth of climbers, which render them, especially along the coasts, nearly impenetrable without cutting. The trees are here, so to say, clothed by them, amongst which a climbing bamboo and prickly canes are the most troublesome. The many short ridges of small height favor the development of these climbers; and I had often more difficulty to ascend a ridge of 200 feet, than to go through a mile's distance in dense but level jungles.

The access, therefore, is made difficult, and the recognition of the different species often very troublesome. No roads or even paths exist beyond Port Blair and Port Mouat worthy of being mentioned, which could facilitate the examination of a larger tract, and therefore the greater part of these forests still remain unknown. The mean height of the trees of the high forests may be calculated to be 100 feet by a girth varying from 8 or 10 feet to one of 10 to 12 feet, showing a clean stem ranging from 60 to 70 feet in height. The number of trees varies (including the trees from four feet girth upwards) from 30 to 40 in an acre down to 20 only. But in many places, as for instance in the bamboo jungles on Middle Andaman, scarcely 10 trees occur in a square of similar size. These, however, are nearly all of a girth of upwards of 10 feet, whilst in the former case scarcely six or eight can be found of such a size.

Numerous smaller trees, amongst which especially the family of Euphorbiaceæ, nutmeg trees, and Anonaceæ are prevalent, grow under the protection of these gigantic trees, attaining a height of 30-40 feet with a small girth, rarely exceeding three to four feet.

Shrubs, chiefly consisting of Anonaceæ, Euphorbiaceæ and Rubiaceæ, but also of Violaceæ occur here in great quantity, but are not very dense in growth with a tendency to shoot up with a single stem. They, therefore, do not offer difficulties worthy of being mentioned. Grass, or any other dense vegetable clothing of the ground is nearly wanting during the dry season; and the yellowish clay, which becomes during that time quite hardened, is then often dusty, wherever man or beasts have made a path.

Difficulty to ascertain forest trees ex habitu.—Although trees may be easily recognized in a country botanically well explored, yet determinations of trees ex habitu in botanically unknown rigions are difficult and fallacious. All

former reports on these islands give ample examples of this, and we see the strangest forms, as pines, beeches, poplars, aloes, &c., noted as growing here.

But even when the species is well determined, we may fail to recognize correctly the same ex habitu in another spot physically differing. This is not only the case on the Andamans, but in all countries which possess more or less a tropical nature. Thus on the sandstone formation Dillenia aurea, Mimusops Indica, Sterculia ornata, Pterocarpus dalbergioides, and a number of others appear as immense trees, nearly 80-100 feet high, with a straight and unbranched stem like a wood-oil tree, but the same trees remain stunted and branched from the first-half of their length on localities where chalk much influences them.

The elevation at which they grow changes the habit still more, though the mountains of the Andamans are not high enough to make the difference conspicuous.

Quality of timber.—We do not possess as yet a thorough knowledge of the value of the timber trees in British India, nor do we possess a general list of the trees growing in the Indian forests. All attention has been directed to a comparatively few kinds, which primarily, from native experience or by some accident, have been found most durable and fit for practical use. Any experimental review and general identification of all the Indian forest trees never has been undertaken, and, therefore, we remain in doubt, or even in total ignorance, about the value of nearly two-thirds of the known forest trees.

It is also a fact that the same species of timber tree changes in quality according to locality.

Under such circumstances, it is not easy to enter into any particulars about the quality of timber trees of the Andamans, until we have ascertained their value by experiment.

Uncertainty of Burmese Names.—It is difficult even in Burmah to obtain the correct native names for plants; but at Port Blair this uncertainty becomes absolute bewilderment, as we have to do with convicts who have no interest in any plant whatever, except edible vegetable productions. Therefore quotations of Burmese names can be made only with great uncertainty, especially as the Burmese convicts—the only ones whom I had to consult—appeared to me very ignorant.

Similar confusion in the Burmese names I observed amongst Major B. Ford's specimens of woods for the Paris Exhibition of 1867, where I saw "Moong" and "Tit-kya" as different timber, but the branches bearing these names were evidently the same plant; also in the specimens called "Tit-phew" and "Chownoo." Tit-phew, however, has been pointed out to me by my men to be some Lagerstroemia, whilst the branches bearing that name seemed to be Euphorbiacea. In the same way, Tit-kya, I found to be Podocarpus polystachya, and Moong a Diospyros, though branches shown to me are both Diospyros, &c. Their excuses in such instances were commonly that the same name was applied to different kinds, and consequently I obtained, for instance, for Baccaurea sapida, Dracontomelon sylvestre, Irina glabra and some Ixora altogether the name of gnasoo!

Trees observed in the forests, their girths, &c.—No trees of such an enormous size, as noted from Burmah, have been observed by me on the Andamans. The largest wood-oil trees which I measured had only a girth of 14 feet 7 inches and 15 feet 3 inches, by a height, perhaps, of 120 feet; whilst Dr. Wallich notes them in his reports as having a girth of 21 feet 4 inches. Trees 250 feet high, as reported to exist in that country, I nowhere met with on these islands.

In an appendix I have drawn up a list of the Andamanese forest trees and their girths, &c. I hope it will give some general idea of these forests, though some common species could not be identified on account of their being at the time of my visit quite leafless and flowerless.

No teak or any first-rate timber.—There is no teak to be found, nor any timber equal to it in quality, so far as my explorations and our general knowledge of the value of timber go.

Palava or Kuppalee forests.—The palava of the Tamils or Kuppalee theet, as now called by the Burmese convicts at Port Blair, is Mimusops Indica, belonging to the natural order of Sapotaceæ. This species yields the wood so much used for gun-stocks by the Madras Ordnance Department, generally known under the name of bullet wood.

Kuppalee, therefore, belongs to the same natural order which yields the bullet wood of Guiana, which is said by Sir R. Schomburgk to be also a species of *Mimusops*.

This tree has a very wide range, occurring not only in Tinnevelly and Ceylon, but also on the Andamans.* At the first mentioned locality it has become so rare, by the great demand for it, that all private cuttings have been prohibited. Dr. Thwaites, writing about this tree, says it is very abundant in the hotter, drier parts of Ceylon, and reports this timber as valuable, extremely hard, strong and durable.

Nowhere, however, do such large quantities of this tree exist as here on the Andamans. Kuppalee occurs all along the coasts wherever level lands or valleys are favorable for its growth, ascending only in a few localities the ridges, up to 300 feet, which border the sea.

The finest and most vigorous trees are found along Macpherson's Straits, and especially along the whole western coast of South Andaman, and on the Labyrinth Archipelago; but the species is abundant also all along the other coasts of these islands in such a quantity that it really forms the whole of the forests in many places.

Kuppalee is the name which the Burmese give to the Andamanese; and it is interesting to notice that we find the camps of the aborigines nearly always placed where Kuppalee theet is abundant, or in other words, where the land is most level and fertile. It grows there in a black rich garden soil to an enormous height, but remains stunted where sandy or calcareous soil is prevalent.

This tree grows up straight, and attains a height of 80 feet and more, with a clean stem ranging from 40 to 50 feet. The girth is, on the average, 12 to 14 feet; but I found very many trees, especially along the western coasts, measuring 19 feet in girth.

The quantity of growing trees is very large, and I have reason to believe that more extensive forests will be found from Island Bay northwards to North Andaman, as the lands appear more level in that direction.

The density of growth (by estimate only) is, on the average, about 20 to 30 trees in an acre, counting only those having a girth upwards of six feet.

It is difficult for me to say how many square miles these Kuppalee forests occupy on these islands. The following numbers are a rough estimate:—

Total circumference of South Andaman approximately=150 miles.

Allowing only two-fifths of the length for being covered by Kuppalee forests (certainly too low an estimate) = 60 miles.

Supposing that these forests should not extend further inland than half a mile on an average=30 square miles of a Kuppalee forests.

According to such an estimate 384,000 to 576,000 trees, with a girth of six feet and upwards, would be present on South Andaman alone. These figures, however, may be found far too low.

Judging from the numerous vigorous seedlings I saw growing, natural propagation must be easy.

^{*} Acc rding to dried speci nens in Dr. Wallich's Herbarium, it occurs also near Amherst in Martaban.

This Kuppalee appears to me to be a most valuable timber tree; and as these forests occur only along the shores, nowhere extending inland further than a mile or so, and then in rather level lands along the creeks, where a landing by boats is rendered easier, the regular working is made more practicable. A road along the coasts would be easy of construction without being compelled to pass over numerous narrow and steep ridges, as is the case further inland.

As the sea encroaches slowly, and the mangrove swamps too, the land on which these trees are growing becomes gradually smaller in extent, and the trees are being destroyed by the influence of sea water. We see sometimes a Kuppalee growing together with mangrove, or a dead stem amongst them.

The "bullet wood" which Major B. Ford mentions, in his report already referred to, was pointed out by him to me as coming from the tree standing at the commissariat offices at Ross Island, that tree is Calophyllum inophyllum. My latter investigations, however, have shown decidedly that Major Ford's specimen of bullet wood must have come from Mimusops Indica.

This wood has been sold for Rs. 50 per ton, and the conservancy of these forests will be a favorable one, especially as I believe this wood could be used advantageously for railways, machinery, &c., where great durability and strength is required. For house building, furniture, &c., it might, perhaps, be found too heavy.

Second-rate timber trees.—Amongst the second-rate timber trees which occur in such a quantity that they may be noted from a practical point of view, I can mention only pyenma or pemah (Lagerstroemia), ganggo or kengan (Mesua ferrea), padouk (Pterocarpus dalbergioides), kokkoh (Albizzia Lebbek), and (Careya sphaerica), which all occur in the high forests.

Along the mangrove swamps are the following kinds notable for their strong wood:—penlay-oong (Carapa obovata), pinlay-kanazœe or soondree tree (Heritiera littoralis), and bewbæ (Bruguiera gymnorhiza).

These trees (except the three last mentioned) are not equally distributed throughout the jungles, but occur more or less frequently. Thus ganggo forms a prevailing type with wood-oil trees (Dipterocarpus laevis) around Aberdeen and Mount Harriet; padouk and pemah are most common at the western coasts and behind Black Creek, as also on the Labyrinth Islands, &c., &c.

All these trees occur also in Burmah in great quantity, but are not worked, as teak is preferable.

The other trees enumerated in my list are dispersed in less number throughout the jungles, or are nearly valueless.

Difficulty of transportation of timber.—As there are no streams, roads, or any other kind of easy communication, the hills and ridges being mostly too steep and made nearly impenetrable by the great quantity of climbers, the transportation of the felled timber will meet with great difficulties.

Also bamboo fit for floating timber has not as yet been found on these islands.

The absence of fresh water during the dry season in most places, as also of pastures and other cultivation, makes the importation of elephants or cattle of burden at present not desirable.

The convict labor, too, is very indifferent (five convicts are said to do the same work as one free native worker), and scarce,—the greatest part of them being required for clearing of lands, erection of stores and buildings, for boatmen, servants, &c.

Their untrustworthiness, moreover, would make the stay of a Forest Officer in the jungles without good protection rather dangerous.

Exportation of these timbers unnecessary.—Such being the case, it appears to me that it is not necessary to allow these second-class timbers to be used from the Andaman Islands as long as we possess such a large stock of teak and other

more valuable timber on the Continent, where labor and security of person are more certain.

They might, however, be usefully employed, as hitherto, for the construction of stores, buildings, &c., on the islands themselves.

Importance to preserve the Andamanese Forests.—It is, however, of the highest importance to preserve the forests on the Andamans.

The whole amount of water and moisture is depending upon the presence of large forests. The scarcity of water on these islands makes it necessary that every precaution should be taken to prevent more jungle being cleared than is absolutely necessary.

Those higher ranges which traverse the eastern parts of South Andaman, on which are the sources of several of the larger creeks, should be spared as much as possible, particularly as their slopes are too steep to undertake any culture on them advantageously.

I recommend also strongly the reading of Mr. Dalzell's important report on the influence of forests in the records of the Bombay Government, No. 76, (new series) to all officers who are employed on the Andamans in clearing lands.

Unhealthiness of level lands likely to be alleged inadmissible.—An opinion prevails that the level lands, when cleared, are unhealthy. This operates as a prominent obstacle to all agri-horticultural undertakings on these islands. It is no wonder, therefore, to see the steepest slopes of the hills cleared, and cultivation begun on the highest summits. Meanwhile, the fertile valleys or level lands are covered by dense jungles, or made inaccessible by borders of mangrove swamps.

The consequence is the great dependence upon importation for food and the great poverty of the so-called self-supporters, who are confined to lands situated most unfavorably.

We all know that clearances of virgin forests (also on the elevated spots) act most unfavorably upon the health of man during the first years, but this unhealthiness is lessened where clearings are effected by burning down the jungles.

Wasteful as this may appear at first sight, it is the only secure means to procure larger tracts of culturable lands. It saves lives and time.

After sufficient cultivation has taken place, this system may of course be abandoned.

The girdling of all the trees growing on a chosen spot is more easily executed; and, after they have been killed, the more valuable timber might be removed for use, the remainder being burned down would thus give a natural manure to the soil, so much wanted in the Andamans.

APPENDIX TO THE REPORT ON THE FORESTS OF THE ANDAMAN ISLANDS.

A List of the Andamanese Forest Trees and their girths, &c.*

* The Burmese names in this list have been corrected as far as possible and reduced to the usage in Birma during my stay in that country in 1867-68,

					AVE	AVERAGE DIMENSIONS	NS.		
Natí ve name.			Botanical name.		Total height in feet.	Height of clear stem in feet.	Girth in feet.	Locality.	BEMARKS.
			Dipterocarpus laevis	•	100	7.0	11.5	The most common tree throughout the islands; in Burmah this tree is said to attain the unusual height of 250 feet by a girth of 25 feet.	Wood, greyish brown, towards the margins lighter coloured, obsolete, narrow straited, coarsely fibrous, close grained, rather heavy. Bark, thin, smooth, of a greyish colour. When not exposed to the wet useful for planking, but attacked soon by the white-ants.
ф 9 ¥			Dipterocarpus alatus		100	0.2	8	Dispersed throughout the jungles	Wood, yellowish grey, rather coarsely fibrous, somewhat heavy. Bark, very thin, greyish. The quality appears the same as the foregoing.
*		:	Dipterocarpus Baudii ?	ů d	*	:	6.3	Only the stump of a felled tree behind Aberdeen bearing some young shoots was seen.	
		· · · · · · · · · · · · · · · · · · ·	Shorea sp	*	*	, , , , , , , , , , , , , , , , , , ,	9 0 0 0 0	Occurs in the jungles around Port Blair according to branches shown to me, and called often saul.	
b A e		:	Hopea odorata	:	02-09	40.50	2-2	Rather rare here; greatest girth measured was 10 feet 1 inch.	Wood, light brown, narrow straited with the duramen indistinct, close grained, heavy and durable. Bark, thin, brownish, fibrous, rather smooth. "Used extensively for boats and canoes by the Burmans, also for house posts, paddles and oars."—(Balfour).
ψ d a		:	Hopea sp.	4 9	20	50	6-9	Aberdeen and Mount Harriet	"For house-building, bows, &c."—(Balfour).
*		:	Hibiscus tiliaceus	*	30.35	5-6	9-4	Most common along the beaches.	
8° 00		:	Thespesia populnea	4 0	30-35	3-4	4-5	As the former.	
Diedoo or Let-pan, Birm Gerengdah, And	• •	2	Bombax Malabaricum	A	100	80	13-8	Common. Greatest girth measured on Termooklee Island was 18 feet 8 inches.	Wood, uniformly yellowish white, coarse, fibrous, loose grained, light. Bark, thin, rather smooth, fibrous, brownish grey. Appears useless and very perishable. For light packing boxes."—(Balfour).
*		:	Eriodendren anfractuosum		100	08	16	Macpherson's Straits	Wood the same as the former and useless. "Yields a spongy wood, for little besides making canoes."—(Balfour).
:		:	Sterculia ornata	* * * * * * * * * * * * * * * * * * * *	90-100	70	60%	In the jungles of deciduous trees	Useless.
* * * * * * * * * * * * * * * * * * *		:	Sterculia colorata	9 9 9	40-50	20-25	3-4	Ditto ditto	Ditto.

10										(67)								
Enthisylation, Eron, Storettin eithers 100 40.00 6-7 Machines Berial 100 1	Ditto	Ditto	E E	"A strong and durable wood, used for boats, piles of bridges, &c."—(Balfour).	's Said to be extremely valuable and as strong as teak or oak; but its durability is not yet tested."—(Balfour).	grey, with a small darker pith, light, Bark, very thin, greyish,			Said to be of little value,						P3 -	"Very good, fine, strong wood and splits with difficulty. Recommended for handspikes, helves, spokes and handles of tools, also packing cases, &c."—(Balfour).	** For every purpose of house-building. The wood is large, straight, strong and durable according to Dr. Roxburgh."—	(balfour under Sapindus rubiginosus).		
Philay-tanazoe, Birm. Sterentis stellas 70 30.40	* * * * * * * * * * * * * * * * * * * *	***		along the shores, but re-	Nowhere such large trees ob- are reported to exist in the Pegu.	***	Dispersed through the jungles.	Common at Mount Harriet.	:	Western coasts around Port Mouat.	Phoenix Bay to Aberdeen.	greatest girth 10	Most common throughout the jungles.	Very abundant, principally in the interior.	A 9	coasts	6. 6. 6.	Port Mouat.	Most common at Port Mouat.	Port Mouat.
Natural Scientification Natural Scientif	2-9	2-9	2-9	3-4	2-9	90	3-4	9-9	8-9	14.4	5.6	8-9	8.6	6-9	4-9	4-5	3-4	3-4	14-4	- min
Finlay-Lanazoe, Birm Steroulia villosa Finlay-Lanazoe, Birm Steroulia fecida Scondree tree, Engl Heritiera littoralis Toun-paewoon, Birm Prerespermum aceroides Tau-mau-gyee, Birm Grewia calophylla Mayanboe, Birm Grewia calophylla Moorijay, Birm Garaga pinnata Moorijay, Birm Canarium euphyllum Toun-rimmath, Birm Canarium coccineo-bracteatum. Toun-rimmath, Birm Chickrassia tabularis Toun-tage, Birm Carapa Molucoensis Toun-tage, Birm Carapa obovata Toun-tage, Birm Carapa Molucoensis Tsaik-chay, Birm Carapa Molucoensis Tsaik-chay, Birm Carapa Molucoensis Tsaik-chay, Birm Carapa Molucoensis Tsaik-chay, Birm Chisogston grandifforum Tsaik-chay, Birm Chisogston grandifforum Tsaik-chay, Birm Chisogston grandifforum Tsaik-chay, Birm Chisogston grandifforum	30.40	40-50	50	6-10	20	15-20	25	25-30	30.40	09	30-35	30-40	40-50	50	20	8-10	20-25	10.15	09	
Lef-khok, Börm Sterculia villoss Lef-khok, Börm Sterculia fectida Soodree tree, Engl Sterculia fectida Toun-paewoon, Börm Heritiera littoralis Tau-man-gyee, Börm Grewia calophylla Moontjay, Börm Flaeocarpus robustus Moontjay, Börm Canarium euphyllum Toun-yimmah, Börm Canarium coccineo-bracteatu Toun-yimmah, Börm Chickrassia tabularis Toun-yimmah, Börm Ohickrassia tabularis Ramanesch, Börm Chickrassia tabularis Sank-chay, Börm Carapa Molucoensis Pen-lay-ung, Börm Carapa Molucoensis Tsaik-chay, Börm Cupania Lessertiana Tsaik-chay, Börm Chicglossum edule Chickrassia tabulia oupanioides Chickrassia tabulia oupanioides Chickrassia challe oupanioides Chicglossum edule Chickrassia challe oupanioides Chicglossum equile Chickrassia challe oupanioides Chicglossum equile Chickrassia challe oupanioides	20	7.0	20	26-30	45-50	30	40	09-09	80	80-90	09	80	90-100	02-09	40-50	30.40	20	40-50	80-90	9
Let.khok, Birm Let.khok, Birm Soondree tree, Engl Soondree tree, Engl Tau-man-gyee, Birm Moontjay, Birm Tau-man-gyee, Birm Moontjay, Birm Toun-yimmah, Birm Arrodah, And Samaneeb, Birm Sunradah, And Pinlay-ung, Birm Pinlay-ung, Birm Pinlay-ung, Birm Tsaik-chay, Birm	:	:	‡	1	e 0 9	1	:	4		1	ım.	i k	:	100	1	-	÷	į	ŧ	:
Let.khok, Birm Let.khok, Birm Soondree tree, Engl Soondree tree, Engl Tau-man-gyee, Birm Moontjay, Birm Tau-man-gyee, Birm Moontjay, Birm Toun-yimmah, Birm Arrodah, And Samaneeb, Birm Sunradah, And Pinlay-ung, Birm Pinlay-ung, Birm Pinlay-ung, Birm Tsaik-chay, Birm	2 2 4	***	*	4 0 0	les	0. 6 8.	1	***	***	0 0 0	acteat	4	stre	0 0	-	:	1	0 0 9		um
Let.khok, Birm Let.khok, Birm Soondree tree, Engt. Soondree tree, Engt Tau-man-gyee, Birm Mayanboe, Birm Moontjay, Birm Arrodah, And Ramaneeh, Birm Sunradah, And Finlay-ung, Birm Pen-lay-ung, Birm Tsaik-chay, Birm Tsaik-chay, Birm Tsaik-chay, Birm Tsaik-chay, Birm Tsaik-chay, Birm	Sterculia villosa		Steroulia feetida	Heritiera littoralis	Pterospermum aceroic	Grewia calophylla	Elaeocarpus robustus	Picrasma Javanica	Garuga pinnata	Canarium euphyllum	Canarium coccineo-br	Chickrassia tabularis	Dracontomelum sylve	Walsura robusta	Carapa obovata	Carapa Moluccensis	Erioglossum edule	Cupania Lessertiana	Harpullia cupanioides	Chisogeton grandiflor
Let-khok, Birm Let-khok, Birm Soondree tree, Engl. Toun-paewoon, Birm Mayanboe, Birm Chin-yook, Birm Moontjay, Birm Moontjay, Birm Arvodah, And Sumaneeh, Birm Arvodah, And Sunradah, And Toun-yimmah, Birm Prinlay-ung, Birm Sunradah, And Ywah-le-byin, Birm Pen-lay-ung, Birm Pen-lay-ung, Birm Tsaik-chay, Birm	9	*			1	:	***	1	*	:	1	7	7	, n , u			4	**	*	;
	8. 7. 0	4.4	9			a 0 0	1	:	:	***	11		4 6	*	0. s 4 .0 0. p	į.	*	:	4	1
	9 8 4			ralay-kanazoe, Birm. oondree tree, Engl.	oun-paewoon, Birm.		au-man-gyee, Birm.	1	hin-yook, Birm	* *	Ioontjay, Birm.		amaneeh, Birm. unradah, And.	wah-le-byin, Birm.	ivm.	en-lay-ung, Birm.	saik-chay, Birm.	0 0 0 0	:	1
	23	24		~				30		32	4	4	4		ala					

	REMARES.		Wood, whitish, very coarsely fibrous, very light. Bark, thin brittle, greyish. Seems to be useless.	Wood, yellowish grey, narrow striated, with a brown, nearly ebony-like and much striated pith of 3-4 inches breadth, coarsely fibrous, close grained, light. Bark, thin, greyish fibrous. Seems to me not a good wood.	Wood greyish with a broad, blackish and ebony-like knotty pith; very coarse fibrous and loose grained, rather heavy,	no value.	"The wood is very difficult to season, but then it is a close grained, beautiful wood, well adapted for cabinet making,	ac. — (Danour).	Wood, loose grained, uniformly greyish, very light. Bark, rather thin. brittle, greyish. Seems to me useless. "A soft, white wood, used for making light boxes, &c."—(Balfour).	Wood, uniformly yellowish, coarse, fibrous, very light. Bark, very thin, whitish. Seems to me useless.	osed for mewood. — (Damour).	Wood, brown, towards the margins whitish, narrow striated, coarse, fibrous, but close grained heavy. Bark, thin. rather smooth, greyish brown, brittle. Appears to be a good wood.	Wood, uniformly yellewish grey, rather, heavy, with a brownish pith, close grained. Bark, brittle thin, greyish. Seems to be a good wood. "Suitable for the purposes of the cabinet-maker."—(Balfour).
	Locality.	Most abundant in the interior.	Abundant	Rather common	Rather common Mount Harriet.	Dispersed throughout the jungles around Port Blair,	Rather common in the jungles of deciduous trees and along the shores.	Dispersed throughout the jungles. In the jungles around Port Blair. Rather a climber.	Common everywhere along the shores	Common along the shores	Shores at South Point.	Along the shores especially	Common, especially in the interior
NS.	Girth in feet.	10-6	6-3	4.5	4-6	00	6.4	65-65	9-5	6-9	160	5-6	8 9
AVERAGE DIMENSIONS.	Height of clear stem in feet.	50	09	25.30	40-45	09	3C=40	20-25	10-15	10-15	90	10-15	40.50
AVER	Total height in c	80-90	80-90	40-50	09	06-08	9-09	40 30-40	20-60	40	50	40	20
	J		1	į	1 1	1	1	11	4	*	į	1	1
	Botanical name.	Pometia tomentosa	Pometia glabra	Mangifera sylvatica	Bonea oppositifolia Spondias mangifera	Parishia insignis	Odina Wodier	Ellipanthus calophyllus Onestis ignea	Erythrina Indica	Pongamia glabra	Dalbergia emarginata	Intsia Palembanica?	Adenanthera Pavonina
		1			* * * * * * * * * * * * * * * * * * *	5 0 0	3 8	1 1	0 0 0 0	4 4	in .	:	
	Native name.	Sabieh, Birm Badoh, And	Hpaga-nya-zoo, Birm	Tha-yet, Birm	Mayan, Birm.	Theet-sae, Birm	Nabbhay, Birm	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Pinlay-kha-theet, Birm	Thawin or Thin-win, Birm.	*** *** *** ***	Pynkadoo, Birm	Bwae-gyee, Birm
	Nos	45	44	45	46	48	49	51	52	53	54	55	92

							(69)								
Wood, blackish brown with whitish margins, narrow striated, close grained, rather heavy. Bark, thin, grey. "Used for furniture."—(Balfour).		Wood, blackish, towards the margins whitish, coarse, fibrous, light. Appears to me useless. Bark, thin, greyish,	Wood, brown, towards the outside lighter, coarse, fibrous, but close grained, narrow striated, heavy. Bark, whitish grey, thin, smooth. Good timber apparently. "A valuable timber tree."—(Balfour).		"Wood, not used,"—(Balfour).	Wood, reddish brown, towards the margins lighter, close grained, coarse, fibrous, very heavy. Bark, rather thick, brown, rough. Appears to be a strong and good wood. Wood hard and durable."—(Balfour).	Wood, uniformly greyish, close grained, rather heavy. Bark greyish, smooth, thin. A good wood. "Wood, dark reddish, hard and durable. Bark used for tanning, good for common house-building."—(Balfour).	Wood, greyish brown, narrow striated, close grained, heavy, and apparently durable. Bark, thin, whitish. At Port Blair much used for house-building.			"Wood, red, hard, of a fine grain and equivalent to mahogany. Is used for construction of carts."—(Balfour).		Wood, brown, lighter towards the margins, close grained, heavy. Bark, thin, fibrous brownish. Seems rather a good wood.			"Wood, hard, close grained, and useful where small timber will serve."—(Balfour).
Common throughout the jungles	South Coast of Middle Andaman.	Common along the shores at Aberdeen	Very common along the western coasts, scarcer along the eastern side. Greatest girth measured 17 feet 7 inches.	Rather common throughout the jungles.	Especially on the eastern coasts of South and Middle Andaman,	Abundant in the mangrove swamps	Abundant in the mangrove swamps	Common throughout the jungles, especially north of N. Corbyn's Cove and on the Labyrinth Islands.	With the former but scarcer; I have seen only sterile trees.	In the jungles of deciduous trees.	Sea-shores, especially western parts	Common along the coasts.	Greatest girth measured 12 feet 6 inches; common throughout the jungles around Port Blair,	Not uncommon,	Abundant along the shores.	Dispersed throughout the jungles
10	1	5-6	1-9	F-	9-10	2-6	5.4	12.	6	12-9	8-9	4-5	6-6	3-4	90	- 1 2 2 2 2 2 1 2 1 2 1
09		30	09	40	40.50	40	20	25.30	40	99-09	10.15	25-30	40-50	20	10-15	25-30
70-80	0.4	50-60	80.90	02-09	80-90	02-09	90-∓0	80.90	80-90	100	20	40-50	02-09	40-50	30	30.40
:	;	i	6.0	÷	40. 40. 10.	1	1	2	1	3	1	:	:	1	1	:
} Albizzia Lebbek	Albizzia Julibrissin	Peltophorum ferrugineum	Pterocarpus dalbergioides	Terminalia procera	Terminalia bialata	Bruguiera gymnorhiza	Rhizophora mucronata	Lagerstroemia hypoleuca	Lagerstroemia sp.	Lagerstroemia sp	Barringtonia speciosa 17.	Barringtonia racemosa	Careya sphaerica	Heptapleurum venosum	Guettarda speciosa	Gardenia furgida
::	2 2	0 0	2	~la ::	4	0	-19	===	7		-1-	-	ملم	*	***	* * * * * * * * * * * * * * * * * * * *
3 3	***	0 	e e b	Birm	# 0 p	1	# #	: :	me	ŧ		÷	4.1	2 F	ž	6 6 0
57 { Kokkoh, Birm. Beymadah, And.	# P P P P P P P P P P P P P P P P P P P	Theet, Birm.	Pa-douk, Birm.	Tangeneh or Bankha, Bailadah, And	Lein, Birm.	Bew-boe, Birm.	Bairadah, Birm. Bairadah, And.	Pyen-mah, Birm. Babdah, And	Ka-moung-thway, Birm.	Thit-pyoo, Birm.	Ryai-gyee, Birm	Kyai-tha, Birm.	Ban-bwae-nee, Birm. Beereegah, And.	Baloo-letwa, Birm.	Dumdodah, And	4.4.+ 42.2.4
22	90	99	09	§ 19	73	63	£ 49	65 2	99	29	88	69	70 }	11	42	7.3

		Remarks.	greyish, close grained, rather heavy. Bark, thin. 1. Seems to be rather a good wood.				Wood, reddish brown, close grained, heavy and resembling much that of the next species. Appears a good wood. Bark rather coarse, brittle, brown. Wood serviceable for house-building, but not used in ships or boats."—(Balfour.)	Wood, reddish brown, towards the margins lighter, rather narrow striated, very close grained, very heavy an durable. Bark, thin, rather smooth, blackish brown, bullet wood. "The timber is extremely hard, strong and durable. Used for gun-stocks."—(Balfour).		Wood, greyish, with a small ebony-like pith, close grained, heavy. Bark, very thin, smooth, greyish. Seems to be rather a good wood.						Wood, uniformly yellowish white, coarsely fibrous, loosc grained, light. Appears useless. Wood of no value."—(Balfour).	"Wood, strong, of a whitish color, and used in Birmah for yokes and cart-poles."—(Balfour),
			Wood, g				Wood, remuch Bark ra									O	Wood,
		Locality.	In the jungles of deciduous trees	Western coasts,	Dispersed throughout the jungles.	North of Mangrove Bay.	Not uncommon around Port Blair	Abundant along the shores, principally along the western side, and there frequently of 19 feet girth.	Dispersed through the jungles.	Dispersed through the jungles around Fort Blair.	Common, north of Mangrove Bay.	Western coasts, scarce,	Not uncommon.	Along the shores, rather scarce.	Not uncommon.	Abundant, especially in the jungles deciduous trees.	Not uncommon.
	ONS,	Girth in feet	8-11	41	ଟଲ	4.60	4-5	14	4-5	£.	6.8	3.4	ಣ	42	5.6	8.8	3.0
1 4	AGE DIMENSIONS.	Height of clear stem in feet.	09	30	25	25.30	30	09	30	25-30	30-40	25	50	50	25-30	02~09	25
	AVERAGE	Total height in feet.	70-80	09	40	09	20	80	0.9	50-60	20	09	30-40	50	50	90-100	09
		namentaliske ovalete enna Cookere for de valetaliske blade film enne en	0 ri c3	* *	n + U	9	*	0 9 6	9	6. 10. 6.	0 0 0	9 -0 +b	10 01 01	9	*	:	:
		Botanical name.	Nauclea wallichiana	Stylocoryne densiflora	Gardenia pulcherrima	Bassia caloneura	Mimusops Elengi	Mimusops Indica	Fagraea morindaefolia	Diospyros sp	Diospyros sp	Diospyros Gardneri	Rospidios vaccinioides	Cerbera Odallam	Alstonia spectabilis	Calosanthes Indica	Spathodea Rheedii
			a a o	8 9 9	0 0 0		0 0 0	9 9 9	4 6 0	m B C	3	10 10 14	13 20 40	e e	# # #	2 0 0 0 7 0	de de
		Native name.	Hteing-bew, Birm,	2 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		Paipan, Birm	Kha-yalı, Birm,	Kuppalee theet, Birm	Thsou-magah, Birm.	Moong, Birm	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Kalwa, Birm	Let-htok, Birm	Kyoung-sha, Birm Baladah, And	Tha-khwot or malwa, Birm.
		Nos.	74	75	76	[o	00 #1	Q3 E-a	80	28	30 03	90	80 40	30 70	86	87	00 09

1. Particular Brews 1. Particular Street 1. Particular Stre										(7	71)							
Experiment, Errors, 1. Spatiboles stipulates 1. Spatiboles stipu	" Wood used for bows and spear-handles, also for paddles and oars." — (Balfour).	Wood, yellowish, with a broad brown pith, coarse fibrous, somewhat heavy. Bark, spongy, rather thick. Seems rather a good wood.	very									Į,	1			Wood, uniformly brown, towards the margins lighter colored, close grained, rather heavy. Bark, fibrous, thin, smooth and whitish. Appears to be rather a good wood. "Said to be of fair quality, and not readily attacked by worms when not exposed to wet."—(Balfour)		light. Bark thin,		rather thin, uneven, greyish. Seems to be a good wood.
Paschthan, Birm. 1. Spethodes etipulata 1. 1. 1. 1. 1. 1. 1. 1	100 100 100				Common in the leafless jungles.	Most common on the south-east corner of Middle Andaman.	behind the			Dispersed through the jungles.	Dispersed through the jungles.	ž	In the leafless jungles, rather rare.	At Muddy Creek on Middle Andaman, and along Macpherson's Straits, where trees are found of 19 feet girth.	Rather unfrequent around Port Blair.		Straits and Port	0 to 10 to 1		Eather common.
Paet-than, Birm Spathodes stipulata 50-60	4-1	11.9	4-6	8-9	10-12	4-2	19	12	4-6	00	00	******	-	11-5	***	m	4	4	3-4	41-0
Paethan, Birm Pajanelia multijuga Faethan, Birm Pajanelia multijuga Eyet-yo, Birm Vitex leucoxylon I ferancosh or Sau-byah, Birm Pisonia alba I ferancosh or Sau-byah, Birm Pisonia visoosissima I ferancosh or Sau-byah, Birm Macaranga tomentosa Macaranga tomentosa I ferancosh visoosissima Agrostisiaohys Indica Malaw, Birm Agrostisiaohys Indica Malaw, Birm Agrostisiaohys Indica Malaw, Birm Agrostisiaohys Indica Malaw, Birm Myristica Irya Myri	30	09	20-30	40-50	60-70	25	90	20-25	25	20-25	20-25	****	*****	25.30	******	25	30	25	20	20
Faethan, Birm Spathodes stipulata Spathodes stipulata Yiex leucoxylon Grachina arborea	20-60	80-90	0.2	06	100	40	50	20	50	40-50	40.50		*******	02-09		40	40-50	40	40	40-60
Faethan, Birm Spathodea stipulata	;	i	‡	:	‡	1	8	-	***	:	3	ŧ	1	:	:	1	#	1	:	;
Ryst-yo, Birm. Wenboah or Sau-byah, Birm. Thoung-the-din, Birm. Toung-hua-yoh, Birm. Toung-hua-yoh, Birm. Ganet-thoo or ka-nazo, Birm. Malaw, Birm. Modoondah, And.						į			* 3.					Macaranga Indica					Baccaurea sapida	Mynistica Irya
	1		6 9 0								,					1	1	*		
	***	3 3	‡		h, Birn											m.	1	·2115.	o, Birn	p #
	111	d.			au-byal											in, Bir		oh, Bir	ka-naz	.pu
	Paet-than, Birr	Paethan, Birm Fogondah, An	Kyet-yo, Birm	1	Memboah or S	* 9.4	ī			ŧ	1			Lekadoo, <i>Birn</i>	**	Thoung-the-d	Poynoo, Birm	Toung-hma-y	Ganet-thoo or	Malaw, Birm, Modoondah, A
								96	16			100	101	102	103	104				4

	TO MI											the margins of lighter color, newhat blackish pith; rather led, rather heavy. said by Roxburgh to be said by Roxburgh to be knich has to be immersed.	n may prove a substitute for	ess.			*	
	REMARKS				Wood of no use.	Ditto ditto.	Ditto ditto.	Ditto ditto.	Ditto ditto.	Ditto ditto.	Ditto ditto.	Wood, reddish brown, towards the margins of lighter narrow striated, with a somewhat blackish pith; coarse, fibrous, but close grained, rather heavy. 'Yielding a valuable timber, said by Roxburgh particularly valuable for work which has to be im in water."—(Balfour).	"A close grained wood, which may prove a substitute for boxwood."	Wood, I suppose, perfectly useless.				
	Locality	Dispersed throughout the jungles.	Common in the jungles around Port Blair, especially at South Corbyn's Cove and at Navy Point,	In the jungles north of Watering Cove.	Common	Mount Harriet	Common	Western coasts	Western coasts	Western coasts	South Corbyn's Cove	Common throughout the jungles	Especially in the jungles north of Viper Island and around Phenix Bay.	e e e e e e e e e e e e e e e e e e e	Cocos Islands, South Andaman; cultivated.	Common throughout the jungles,	South Corbyn's Cove.	Flat shallows at the path to Port Mouat,
NS.	Girth in feet.	3.4	2-3	4	4-5	4-5	10.5	10	00	9	6-9	7 €8	6-3	50°52	3-4	3.31	60	67
AVERAGE DIMENSIONS,	Height of clear stem in feet.	20-25	15.20	20	20	25	02	10-12	8-12	20	40	0.2	40-50	2-9	20	20-60	10.12	5-10
AVER	Total height in feet.	40-50	30	20	50	20	100	30.40	90	40	100	100	02-09	15-20	09	02-09	30	25
		3	:	1		1	ŧ	44.4	1	:	;	Ĭ.,	1	¥	:	1	1	*
	Botanical name.	Celtis sp.	elutina	Girronniera nervosa	Fieus hispida	Ficus	Ficus Laccifera	Ficus nitida	Ficus dictyophylla	Ficus comosa	Ficus infectoria	Artocarpus Chaplasha	Podocarpus polystachya	Cycas Rumphii	Cocos nucifera	Pandanus Andamanensium	Cordyline augustifolia	Cordyline sp
					6 0 0	:	pla	‡	***	**	;	11	2	:::		4	1	
	ne.			***			shooah.	ā	:	3	1	9-1	Ŷ	: 0	***	*	- 1	4
	Native name.			:	lah, An	-	Young-shooah-tha,	:	Ė	-	å 9 0	Birm,	irm.	Birm., And.	4	d	**	**
	Nat			9	dakah bon	***	Bodhi or Yo Birm Rowdah, And.	:		**	1	Toung-peing, Birm. Kai-darek, And.	Theet-kya, Birm.	Mu-daing, Birm. Gneberdah, And.	Jing, Birm.	Mangdah, And.	***	0 0 0
	Nos.	601		111	112		114	115	116	117	118	119	120	} 121	122	123	124	125

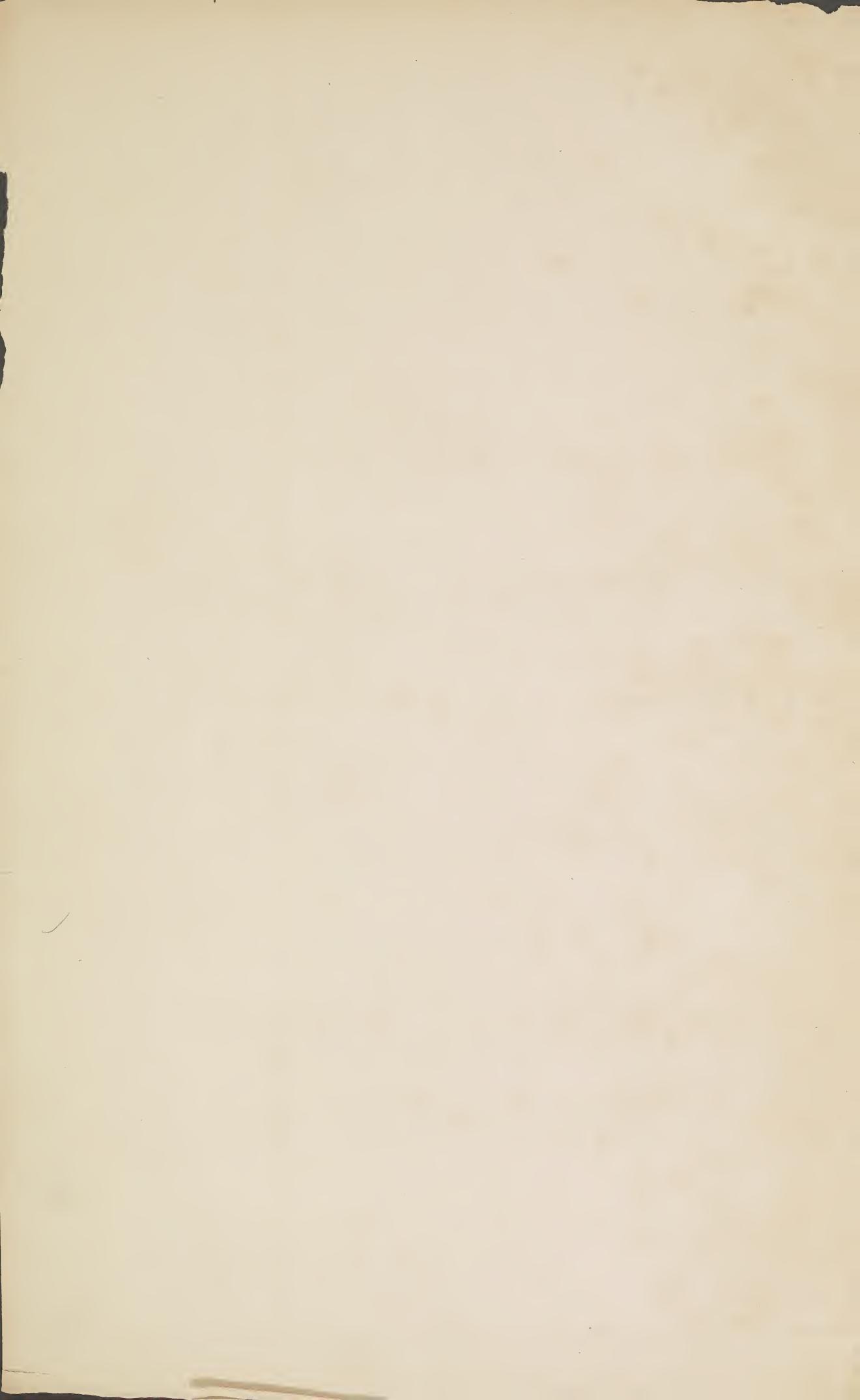
										(73)	1						
	Wood, uniformly yellowish, close grained, rather heavy, rather good. Bark, thin, quite smooth, greyish.	Wood, uniformly yellowish, rather coarse, fibrous, very light,					Wood, brownish, narrow striated, close grained, light. Bark, whitish, thin.		Wood, greyish, with a black ebony pith much intervened, and half a foot broad very close grained and heavy. Bark, dark grey, thin, rather smooth and brittle.	Wood, light reddish, rather coarsely fibrous, rather heavy. Bark, thin, fibrous, brownish.	Wood reddish brown, broadly striated, rather close grained and heavy. Bark, blackish brown Seems to be rather a good wood.	Wood, reddish, ebony-like, nebulous, close grained, hard, heavy, and seems to be durable.			Wood, grey, with a very large brown heart wood, very narrow striated, close grained, heavy, and appears durable. Bark, thin, brown, and very deciduous.	Wood, greyish brown, towards the margins whitish, narrow striated, loose grained, light, and useless.	Wood, light brown, towards the margins whitish, coarse, fibrous, light, and seems useless. Bark, very thin, greyish.	Wood, uniformly yellowish grey, coarse, fibrous, very light, useless. Bark, very thin, fibrous.
	4	**					1		•	•	9	*			*	İ	1	:
	air	ir					3			:	*	:		Island.	*	1	* *	:
	ort Bla	ort Bla					;		;		1	:		Viper	9		į	3
	und P	and P	-41	40			:		1	î	*	1			* * * * * * * * * * * * * * * * * * *	:	*	:
	les arc	les aro	rt Blair	rt Plan			4		:		0. P. R	:		les nor	eaves	:	1	:
*.	In the jungles around Port Bl	In the jungles around Port Blair	Around Port Blair.	Around Port Plair.	Not seen.	Not seen.	Not seen	Not seen.	Not seen	Not seen	Not seen	Not seen	Not seen.	In the jungles north of	Seen only leaves	Not seen	Not seen	Not seen
fectly known	$1.1\frac{1}{2}$	2-9	13.10	12	6 6 8 8 8		•		:	0 0 7 2	6 0 0	5 0 0 0	:	- 14	:	0.00	- 0 - 6 - 6 - 0 - 0 - 0	
B.—Forest trees, imperfectly known.*	10-12	90	6 6 8 9 9	1	# # # # # # # # # # # # # # # # # # #	4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	*****	:	1 N O O O O O O O O O O O O O O O O O O		6 0 0 0 0	0 0 0	7.0	0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0		:	*******
B.—Fores	30	20-60	100	09	10	200000		0 0 0 0	***	***		******	*******	100		*	* * * * * * * * * * * * * * * * * * *	*****
	:	:		n Mi-	***	9 9	Albizzia	1	e. 6	4	:	i es	9 9	1	:	i	ntale	* * * * * * * * * * * * * * * * * * * *
		:: e3	a.	er from	9	Called Schleichera frijuga		1	1	· m	:	Called Carallia integerrima	9 9	:	ta	1	Anacardium occidentale	ea
		Prunus Martabanica		Appears not to differ musops Indica,	b	ichera	(called	9	0	Called Berrya mollis	·ds u	lia inte	O.	6.	Called Hopea odorata	:	ardium	a arbor
	ylon's	is Mar	er.	ppears not to c musops Indica,	6.	Schle	Leguminosa stipulata.)	rgia	yros	Berry	Calophyllum sp.	l Caral	ç.	Leguminosa?	Норея	1	Anace	Carey
	Claoxylon sp.	Prunt		Appearing	Hopea?	Called	Legur	Dalbergia	Diospyros	Callec	Calop	Called	ç.	Legui	Called	:	Called	Called Careya arborea
	* * * * * * * * * * * * * * * * * * * *	9	à		*	\$		9 0	0 0	4		4			3	:	9 9	*
	;		:	1	8 9	:	b.	2 4	:	0 0 0	1	**	:	:	# # #	0 0 0	1	*
	n.		2.0	·m.	·m.	0 0	Sirm.	23	Gjoot or Touk, Birm	rm.	irm	.217972.	:	Birm.	Birm.	**2	The-ho-the-yet, Birm.	Birm.
	o, Birn	Birm.	, Birn	ah, Bin	00, Bir	·m·	ai-za, I	Birn	Touk,	on, Bi	hee, B	gah, B	, Birm	shap, J	1-nee,	l, Birm.	the-vet	y-bew,
	Chownoo, Birm.	Pannoo, Birm.	Kemouw, Birm.	Thoungah, Birm.	Thingadoo, Birm.	Gyo, Birm.	Bung-mai-za, Birm.	Yin-dike, Birm.	joot or	Hpet-Woon, Birm.	Thara-phee, Birm	Meneawgah, Birm	Paumah, Birm.	Young-tshap, Birm,	Thengan-nee, Birm.	Paingnai,	he-ho-r	Bambway-bew, Birm.
					130 T		132 B	133 Y	134 G	135 H	136 T	137 M	138 P	139 Y	140 T			
	126	127	128	129	15	131		1	Ä		F	H	H	H	H	141	142	143

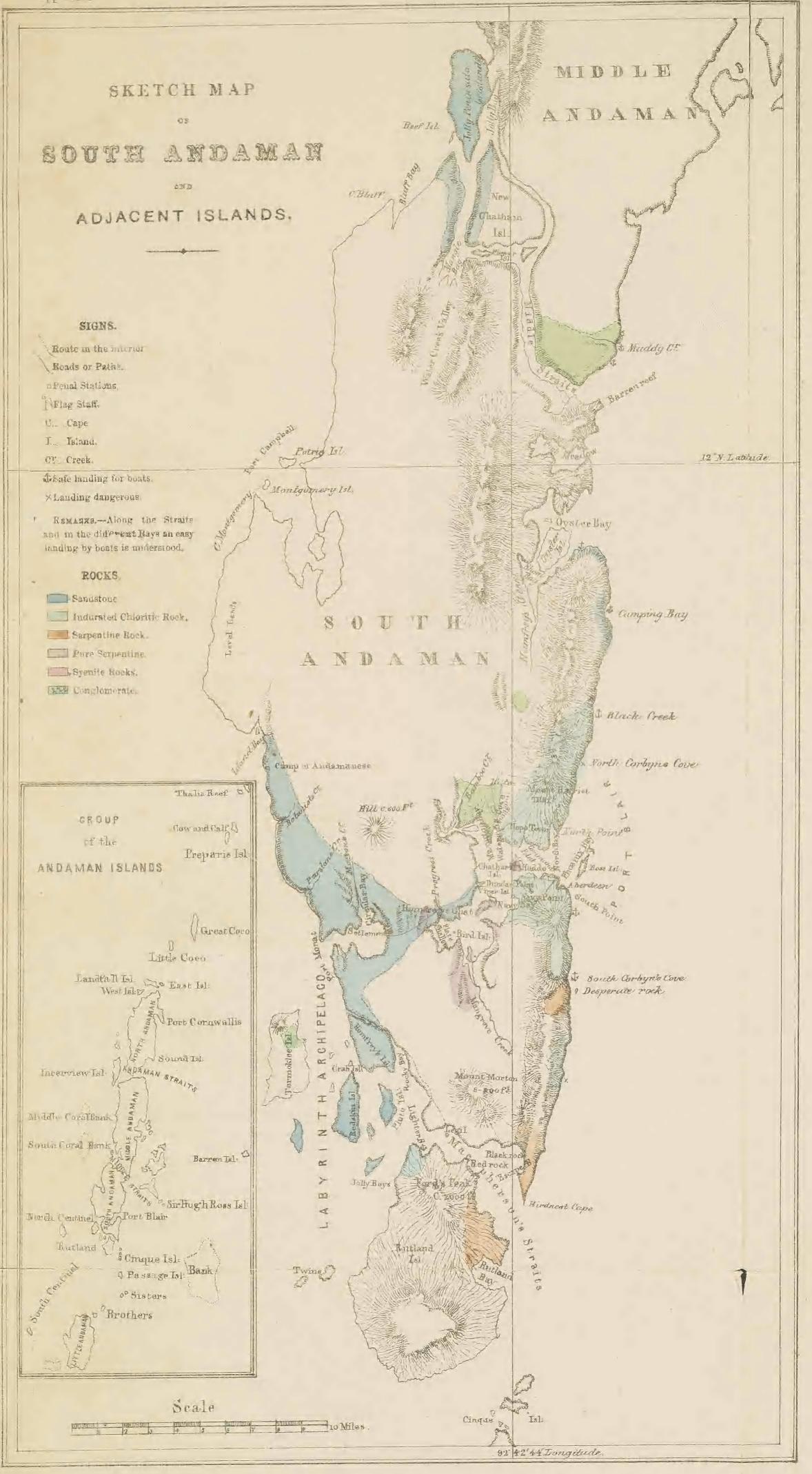
This includes the Burmese and Botanical names which were attached to certain specimens of timber which I saw at Port Blair. I could not authenticate the Botanical names attached to these specimens, except No. 127, which ought to stand as No. 60-bis.

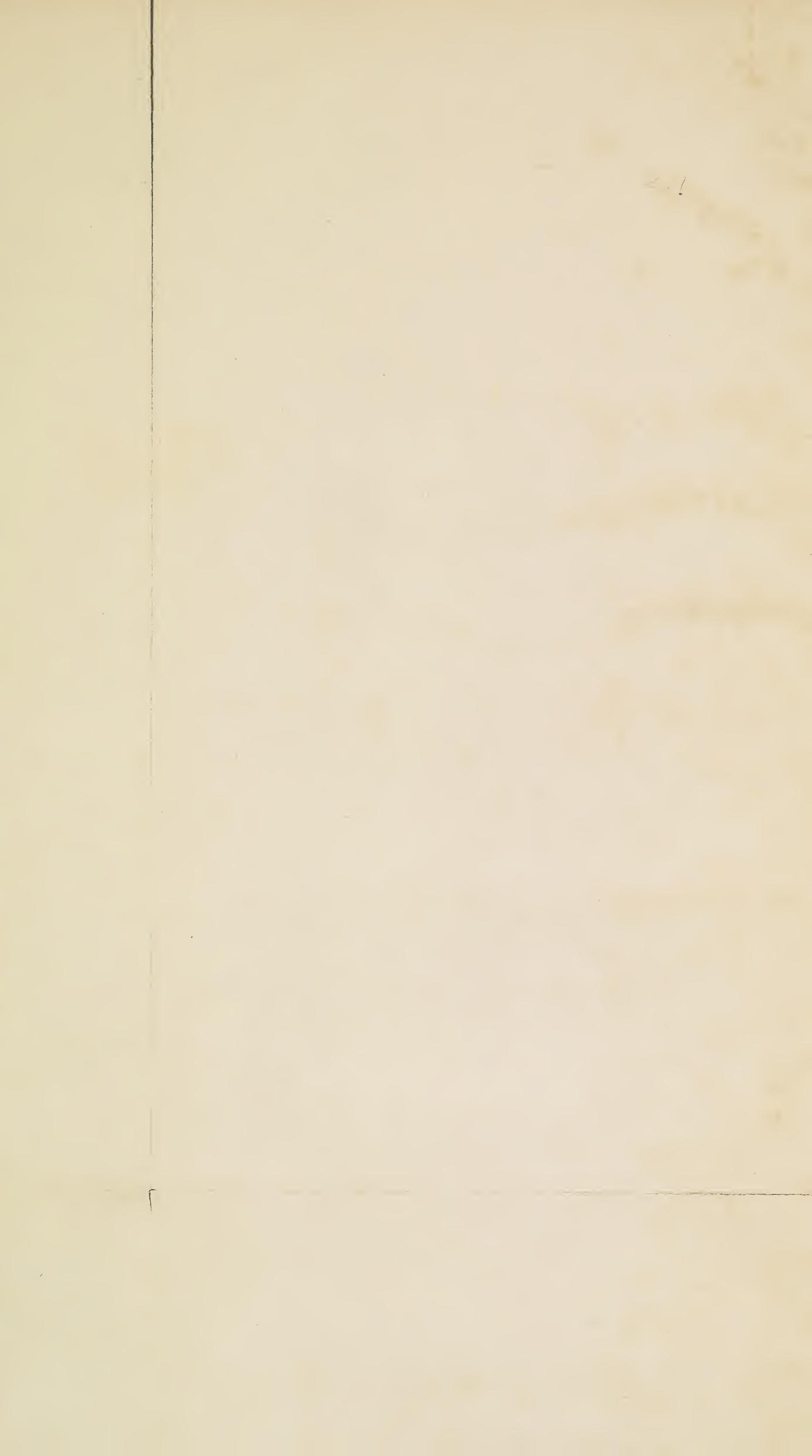
	REMARKS,	Wood, yellowish, close grained, rather heavy, smooth thin crevish brown seems to be rether	DO TOUTON OF			Wood, yellowish grey, obsoletely striated, coarse, fibrous.	grained, rather heavy, not a good timber.								Yields the Burman box-wood.									
	Locality.	Not seen	Not seen in the forests.	Not seen in the forests.	In the jungles around Aberdeen.	Not seen	Small trees, with girth under three feet, useful for fancy woods.	Common throughout the jungles.	Along the coast principally.	On the Andamans, according to Dr. Roxburgh.	Macpherson's Straits.	Mount Harriet, rare.	Coasts around Port Blair.	Muddy Creek.	Dispersed throughout the jungles	Dispersed throughout the jungles.	Sea shores behind the mangrove swamps.	Mangrove swamps.	Mangrove swamps.	Coasts, rather common.	Tolly Peninsula.	Western coasts, common.	North Corbyn's Cove,	
ONS.	Girth in feet.	0 0 0 0		:	4	0 0 0 0	e feet, useful	12.2	1, 2, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 2, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,		22-3	$2 - 2 \frac{1}{2}$	1.2	1.2	63	G.	=======================================	67	2	767	23-3	2.3	63	
AVERAGE DIMENSIONS.	Height of clear stem in feet.		**	:	15-20	0 0 0 0 0	rth under thre	18-20	4.5		50	10-12	3.6	12-20	12-15	0-12	0.10	12	10-12	10	3.6	25	20	
AVER	Total height in feet.	***	:	***	40-50	0 0	I trees, with gi	30-40	20-26	0 0 0 0	30-35	25-30	30	96-06	30	30	20	20	20	20	20-30	90	95	
		**	:	:	:	*		;		:	:	*		*	:	:	:	:	:	* *	8 8	*	d 0	
	Botanical name.	Called Diospyros Mollis	Euphoroiacea	Meliacea	. Careya	Vitex	Ö	Polyalthia Andamanica	Flacourtia rotundifolia	Garcinia Kydiana	Sterculia parviflora	Grewia microcos	Acronychia pedunculata	Glycosmis Arborea	Murraya exotica	Ochna squarrosa	· Cynometra bijuga	Sonneratia alba	Sonneratia apetala	Jambosa alba	Acmena leptantha	Eupteron sp. nov	Brassaiopsis Andamanica	
		•			11 0	:		*	:		*	* * * * * * * * * * * * * * * * * * *	•	:	•	:	•	:	:	•	•	•	*	
	oame.		e, Birn		39 80			ф 0 4	:	80 0 0 0 0	•	*	0			*	6 6	.me.		:	:	•	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	Native name.	Tay, Birm	Thoung-the din-boe, Birm.	Ah-houng-gah, Birm.	Thinapeh, Birm.	Htouk-shah Birm.		8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0	:	# # # # # # # # # # # # # # # # # # #	Mya-ya, Birm.	0 0 0 0 0 0	# # # # # # # # # # # # # # # # # # #	Tha-nat-kha, Birm.	Ksen-way, Birm.	Maingga, Birm.	Taba or to-ma, Birm.	0 d	•	0 0 0		•	
	Nos.	144	145	146	147	148		149	150	151	152	153	154	155	156	157	158	159	1.60	191	162	163	164	

	Yields the Bouch wood, of a bright yellow colour, and affording a dye of the same color,																	
Coasts, common.	Rather frequent	Port Mouat.	Port Blair sea shores.	Ditto.	Most common throughout the jungles.	Aberdeen and Mount Harriet.	Aberdeen.	Middle Straits.	Western coasts.	Middle Straits.	North Corbyn's Cove.	Common throughout the jungles.	Especially at Bird-nest Cape and on Termoklee Island.	Common throughout the jungles,	Common.	Middle Straits.	Mount Harriet.	Most common all along the shores.
20-03	50 70	2-23	$2 - 2\frac{1}{2}$	$2-2\frac{1}{2}$	$2.2\frac{1}{2}$	ෙ		F=+	$1\frac{1}{2} \cdot 2^{\frac{1}{2}}$	<u>—</u>	ෙ	2.21	- - - - - - - - - - - - - - - - - - -	1.11	03.1	$0\frac{3}{4}$ -1		22-3
10-12	10-12	20	8-0	12	15	15	10	10	12.15	10	15-20	12-15	4	4-10	15-20	15-20	6 6 6 0 0	0-10
30	90	30	15.25	30	30	96	25	25	30	25	30-36	25-30	20-25	20-25	25	25	0 0	30
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:	4) 40 60	:	ra	0 0	* * *	*	8 9 40	 	billa	*	hyllur	:	mnso	lis	*	:	ii	:
4 0 0	eata	*	amiflo	olia	* *	**	Celferi	irsutu	raesem	:	nacrop	ina	spino	rienta	*	OSa	Kuhli	18
Pavetta sp.	Morinda bracteata	Coffea sp.	Chionanthus ramiflora	Vitex diversifolia	Claoxylon sp.	Ryparia caesia	Phyllanthus Helferi	Phyllanthus hirsutus	Antidesma Ghaesembilla	Euphorbiacea	Cyclostemon macrophyllum, Bl.	Myristica laurina	Plecospermum spinosum	Epicarpurus Orientalis	Areca triandra	Pheenix paludosa	Ptychosperma Kuhlii	Pandanus verus
0 0	# & #	0	0 0	ф ф ф		9 6 0	*	a e 0	* *	© 0	0 0 0	:	Ø Ø Ø		0 0	* **		::
*	is or is														*	*		::
000	Nyan-hwee, Birm.	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0	0 0 0	0 0 0 0	•	0 0 0	0 0 4	0 0 0	:	0 0 0	ф ф В	ф 0 0	0 0 0	Kwon Thoung, Birm.	That boung, Birm.	-	Ksat-tha-phee, Birm. Oodelet, And
165	166	167	168	169	170	171	172	173	174	175	921	177	178	179	180	o ū	. 1	183 {

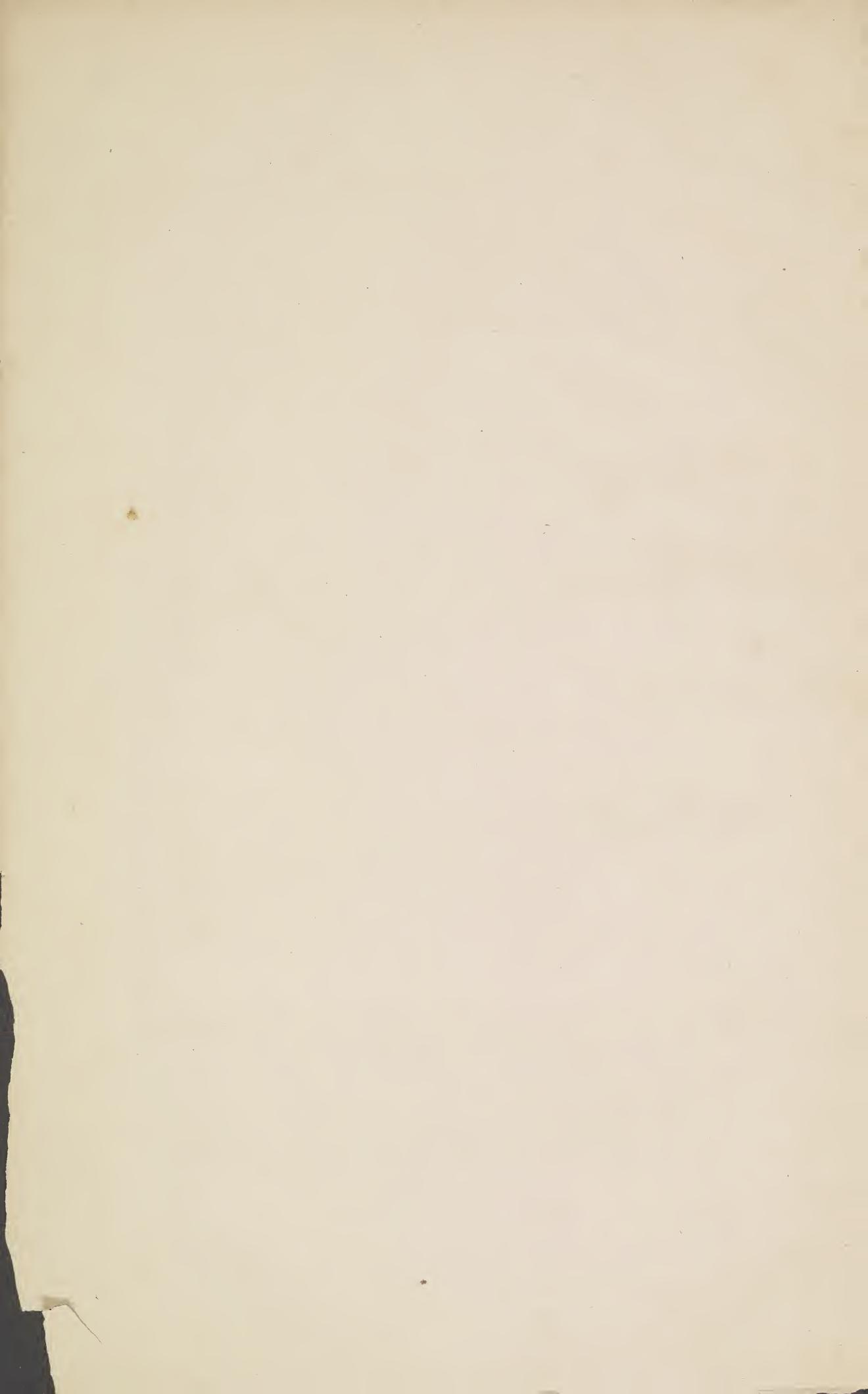
REMARK.-It is understood that the girths in the preceding list are taken six feet above the ground; the height, in most cases, is taken by estimate only.













REPORT

ON THE

VEGETATION OF THE ANDAMAN ISLANDS.

By Mr. S. KURZ,

CURATOR OF THE HERBARIUM, ROYAL BOTANICAL GARDENS, CALCUTTA.

ACCOMPANIED BY A REPORT ON THE FORESTS,
AND A MAP.

CALÇUTTA:

OFFICE OF SUPERINTENDENT OF GOVERNMENT PRINTING.
1870.



